FWHA–ID–EIS–04–1–D

Fernan Lake Road Safety Improvement Project
Idaho Forest Highway 80 (ID PFH 80)
MP 0.0 to MP 10.7
Kootenai County, Idaho

DRAFT ENVIRONMENTAL IMPACT STATEMENT

DRAFT SECTION 4 (f) STATEMENT

Submitted Pursuant to 42 U.S.C. 4332 (2) (c)
(and where applicable, 49 U.S.C. 303) by the
U.S. Department of Transportation
Federal Highway Administration
Western Federal Lands Highway Division

Cooperating Agency

U.S. Forest Service

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Division Engineer
Western Federal Lands Highway Division

Date

Going Metric

In accordance with recent executive orders and direction from the U.S. Secretary of Commerce, project plans of the Federal Highway Administration and supporting agencies are to be converted to metric units. This memorandum gives measures in both metric and English units. Here is a brief summary of units used in the report and how they can be converted.

Measure	Metric	Multiply by	English
Area	hectare (ha)	2.4710	acre (ac)
	square kilometer (km^2)	0.3861	square mile (mi^2)
	square meter (m^2)	10.7639	square foot (ft^2)
Concentration	microgram/liter (ug/l)	1	parts per billion (ppb) approx
	milligram/liter (mg/l)	1	parts per million (ppm) approx
Distance	centimeter (cm)	0.3937	inch (in)
	meter (m)	3.2808	foot (ft)
	kilometer (km)	0.6214	mile (m)
Speed	kilometers per hour (km/h)	0.6214	miles per hour (mph)
Volume	cubic meter (m^3)	1.3080	cubic yard (yd^3)

Abbreviations and Acronyms

4(f)	Section 4(f) of US Department of Transportation Act (1966)
AADT	annual average daily traffic
AASHTO	American Association of State Highway and Transportation Officials
ADT	average daily traffic
ATV	all terrain vehicle
CCC	Civilian Conservation Corps
CMP	Corrugated metal pipe
COE	US Army Corps of Engineers
DEA	David Evans and Associates, Inc.
DHV	design hourly volume
DP	dissolved phosphorus (in water)
EIS	environmental impact statement
ESA	Endangered Species Act
ESHD	East Side Highway District
FEMA	USDHS Federal Emergency Management Agency
FHP	Forest Highway Program
FHWA	Federal Highway Administration
FLR	Fernan Lake Road (ID FHP 80)
FLWTAC	Fernan Lake Watershed Technical Advisory Committee
FR	Forest Service road
FS	USDA Forest Service
FWS	USDI Fish and Wildlife Service
HRT	hydraulic retention time
HW/D	headwater-to-diameter
I-90	Interstate 90
ICDC	Idaho Conservation Data Center (IDFG)
IDEQ	Idaho Department of Environmental Quality
IDFG	Idaho Department of Fish and Game
IDL	Idaho Department of Lands
IDPR	Idaho Department of Parks and Recreation
INFS	Inland Native Fish Strategy
IPNF	Idaho Panhandle National Forests
ISHDM	Interactive Highway Safety Design Model
ITD	Idaho Transportation Department
KCATP	Kootenai County Area Transportation Plan
LWD	large woody debris
MA	management area (FS)
MIS	management indicator species (FS)
mvm	million vehicle miles
NEPA	National Environmental Policy Act
NFMA	National Forest Management Act
NFS	National Forest System
NRCS	USDA Natural Resources Conservation Service
NWI	National Wetlands Inventory
ORV	off-road vehicle
PDO	personal damage only (accident)
RHCA	riparian habitat conservation area
ROD	record of decision
ROW	right of way
RVD	recreation visitor days
SCS	USDA Soil Conservation Service (now NRCS)
SEE	Social, Economic, Environmental (team)
SWPPP	storm water pollution prevention plan
TN	total nitrogen (in water)
TP	total phosphorus (in water)
TSI	Trophic State Index
USGS	USDI Geological Survey
WFLHD	Western Federal Lands Highway Division
WPA	Works Progress Administration

Abstract

Idaho Forest Highway 80 (ID PFH 80), commonly known as Fernan Lake Road, is a two-lane paved road between the City of Coeur d'Alene and Fernan Saddle, a geographic feature in the Idaho Panhandle National Forests (IPNF) in Kootenai County. Fernan Lake Road is the most heavily used road on the Coeur d'Alene River Ranger District of the IPNF. Idaho Transportation Department (ITD) records show it has a much higher accident rate than similar roads statewide. East Side Highway District (ESHD) reports it has the poorest conditions of all the roads it maintains. The road was constructed in the 1930s and has been improved over the years, but lacks stormwater treatment to protect the water quality of Fernan Lake and Creek.

The Western Federal Lands Highway Division of FHWA is the lead agency for project development, environmental evaluation, preparation of the Environmental Impact Statement (EIS) and a Record of Decision (ROD), and construction contract management of Fernan Lake Road Safety Improvement Project. IPNF, ITD, and ESHD are partner agencies and participants on the FHWA's Social, Economic, and Environmental (SEE) team.

FHWA and the partner agencies propose to reconstruct or resurface 17.2 km (10.7 mi) of Fernan Lake Road. The road is divided into three segments for this project:

Segment 1, MP 0.0 to MP 2.2, mostly along the north shore of Fernan Lake,

Segment 2, MP 2.2 to MP 5.0, along the west side of lower Fernan Creek, and

Segment 3, MP 5.0 to MP 10.7, entirely in IPNF along steep upper Fernan Creek.

In response to public comments during the National Environmental Policy Act (NEPA) process, ten alternative routes that mostly avoided Fernan Lake Road altogether, and seven preliminary designs that made extensive use of the current road alignment, were evaluated by the SEE team. All ten alternative routes were eliminated from further consideration because they failed to meet the project purpose, needs, and/or objectives. Four preliminary designs were eliminated because only minor reductions in accidents could be expected when compared to the existing road, in spite of substantial road widening that in turn would cause substantial environmental impacts.

Three build alternatives (E, Fm, and G), and the No Action (No Reconstruction) Alternative are fully analyzed in the Draft EIS. All three build alternatives would reconstruct Segments 1 and 2 of the existing road, whereas only maintenance resurfacing and culvert improvements are proposed for Segment 3 within the IPNF boundary. The three build alternatives primarily differ between MP 1.0 and the end of Segment 1. Alternatives E and G differ in the location and configuration of the bridge proposed across Lilypad Bay. Otherwise both essentially follow the alignment of the existing road. Alternative Fm leaves the current alignment near MP 1.0, climbs the adjacent hillside, and while descending the hill, avoids Lilypad Bay by crossing this area farther to the north.

Except for differences to accommodate the transition between Segments 1 and 2, Alternatives E, Fm, and G are very similar in Segment 2. All three raise the road profile above the 100-year flood elevation. The required widening of the road prism to accommodate the increase in road profile causes the road base to extend into wetlands and Fernan Creek channels that are immediately adjacent to the existing road. There is no difference among the three build alternatives in Segment 3.

The three primary reasons to construct one of the build alternatives are:

To maintain a safe transportation link between the City of Coeur d'Alene and IPNF at Fernan Saddle that efficiently accommodates traffic projected through 2026.

To upgrade stormwater treatment along Fernan Lake Road to protect water quality in Fernan Creek and Fernan Lake.

To provide a roadway that can be reasonably maintained in a sustainable manner by ESHD.

Abstract

The SEE team unanimously selected Alternative G as the preferred alternative. The selection considered advantages and potential disadvantages of Alternatives E, Fm, and G, as well as the No-Action Alternative, in terms of the following factors:

- Overall Purpose and Need
- Improved Traffic Safety
- Impacts to the Physical Environment
- Impacts to Fish, Wildlife, and Plant Populations and Habitat
- Impacts to the Human Environment
- Reduced Road Maintenance
- Constructability, including estimated construction cost
- New Right-of-Way Required
- Degree of Risk or Uncertainty (unknowns that might delay final design or permitting, or interrupt construction).

Alternative G had either highest or moderate ratings for all factors considered in selecting the preferred alternative. This alternative would most closely follow the existing road alignment. Construction of the new curved bridge across Lilypad Bay would occur behind the existing causeway, thus protecting the lake from related short-term impacts to water quality. Alternative G would have fewer visual impacts than the other two build alternatives. All of the improvements in traffic safety, stormwater treatment, roadway maintenance, and parking along the lake that are found in the other build alternatives would be provided by Alternative G.

This Draft EIS is open to public comment and review until July 31, 2004, 45 days after the Notice of Availability was published the *Federal Register*. Comments concerning this Draft EIS should be sent to

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Comments can also be submitted electronically via the Internet. The Draft EIS is available for review at http://www.wfl.fhwa.dot.gov/projects/fernan/ where you can find directions for submitting comments.

Copies of the Draft EIS can be reviewed at the following locations:

Idaho Panhandle National Forests
Supervisor's Office
2502 Sherman Ave.
Coeur d'Alene, ID 83814

Idaho Panhandle National Forests
Coeur d'Alene River Ranger District
2502 East Sherman Avenue
Coeur d'Alene, ID 83814

Federal Highway Administration
Western Federal Lands Highway Div.
610 East Fifth Street
Vancouver, WA 98661

East Side Highway District
6095 E. Mullen Trail Road
Coeur d'Alene, ID 83814

Kootenai County Planning Department
451 Government Way
Coeur d'Alene, ID 83814

FHWA – Idaho Division
3050 Lakeharbor Lane, Suite 126
Boise ID 83703

Idaho Transportation Department
600 W. Prairie Ave.
Coeur d'Alene, ID 83815

City of Coeur d'Alene Planning Dept.
710 Mullan Ave
Coeur d'Alene, ID 83814

Coeur d'Alene Public Library
201 East Harrison Ave.
Coeur d'Alene, ID 83814

Spokane Public Library
906 W. Main
Spokane, WA 99201

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1.0 PURPOSE AND NEED

This Draft EIS for the Fernan Lake Road Safety Improvement Project documents an analysis of the potential environmental consequences of proposed road reconstruction and maintenance in Kootenai County near Coeur d'Alene, Idaho. Development of three build alternatives and the No Action Alternative are summarized in Chapter 2. Existing conditions, environmental consequences of the alternatives, and proposed mitigation to avoid or reduce impacts are discussed together in Chapter 3.

The analysis in this EIS complies with provisions of NEPA. FHWA determined that the proposed project may likely "significantly affect the quality of the human environment" based on a review of the project relative to environmental issues and concerns, including those provided by the public. Therefore, an EIS is being prepared instead of an Environmental Assessment.

This EIS has been prepared in compliance with FHWA's Environmental Impact and Related Procedures (23 CFR 771). These procedures are further described in FHWA guidebooks and manuals (FHWA, 1996, 1999a, 1999b). USDA Forest Service (FS) environmental procedures (FS, 1992) are followed concurrently, and IPNF is the cooperating agency in the federal NEPA process.

FHWA has issued this Draft EIS for public comments, which will be considered in preparing the Final EIA. After the Final EIS is issued, FHWA will select one build alternative, a combination of the build alternatives, or the No Action Alternative. The final selection will be documented by FHWA in a ROD issued at least 30 days after the Final EIA is published.

1.1 PROPOSED PROJECT

FHWA and the partner agencies propose to reconstruct or resurface 17.2 km (10.7 mi) of Idaho Forest Highway 80 (ID FHP 80), which is commonly known as Fernan Lake Road. Reconstruction within the existing road corridor is proposed for all or most of Segments 1 and 2, depending on the build alternative selected, whereas maintenance resurfacing is proposed for Segment 3 within the IPNF boundary (Figure 1-1). The proposed project begins approximately 0.7 km (0.4 mi) northeast of the Sherman Avenue interchange (Exit 15) with Interstate 90 (I-90). Project milepost (MP) 0.0 is located at the intersection of Fernan Lake Road with Lakeview Drive and Fernan Court.

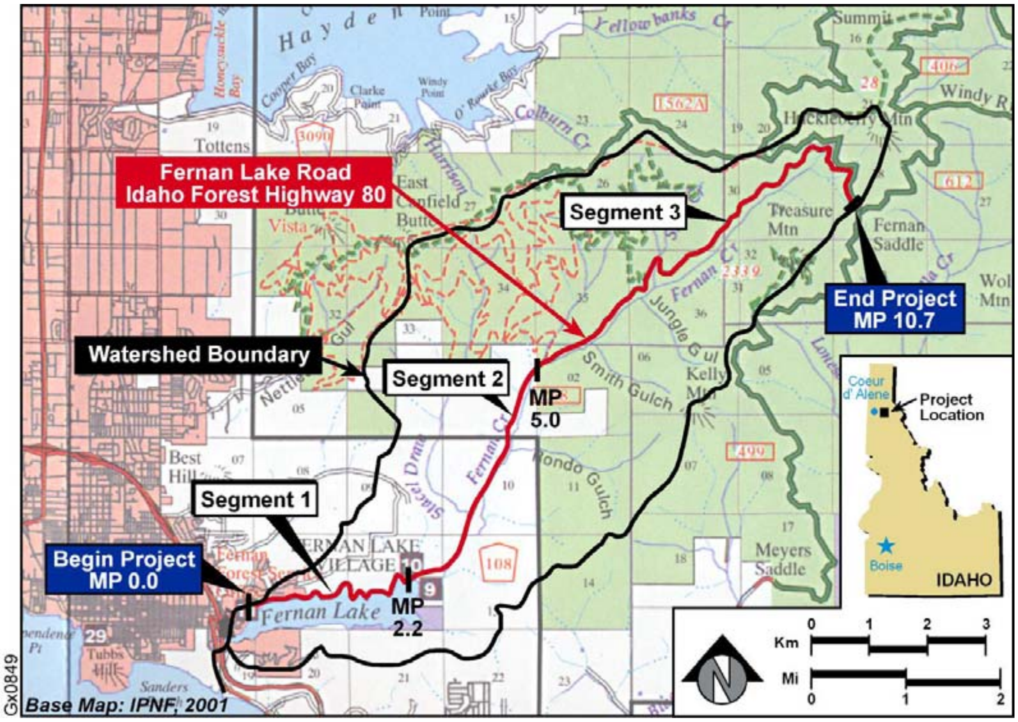

Figure 1-1. Project Location Map

Segment 1 of the existing road winds along the north shore of Fernan Lake, then crosses Lilypad Bay in the northeast part of the lake, and ends at MP 2.2 just east of a boat launch at the east end of the lake. Reconstruction being analyzed in this segment includes improved alignment and grade, curve widening, minor road or shoulder widening, guardrails, and bridge construction across Lilypad Bay.

Segment 2 extends northeastward up the broad lower valley of Fernan Creek and ends at MP 5.0 where IPNF management of National Forest System (NFS) lands begins. This segment is relatively straight and the majority of proposed reconstruction for all build alternatives is improved grade and subgrade to elevate the road above the regulated floodplain and to improve drainage.

Segment 3 winds mostly northeastward while climbing the relatively steep upper valley of Fernan Creek until ending at MP 10.7 where a large parking area has been developed on Fernan Saddle. All build alternatives would resurface this segment at the current road width and provide spot improvements, but without reconstructing the road or changing its alignment or grade.

If the ROD selects a build alternative by the end of 2004, then final design would be conducted in 2005 and 2006. Construction would begin in 2007 and is scheduled to take two years.

For all build alternatives the project would include:

- Constructing a new road surface composed of crushed aggregate base and asphalt concrete pavement.
- Installing adequate drainage structures.
- Installing sub-surface drainage features and subgrade stabilization measures.
- Widening the road in Segments 1 and 2 to accommodate current and projected vehicular and recreational use and necessary maintenance activities.
- Constructing new cut-slopes and retaining walls in Segments 1 and 2.
- Removing roadway built on fill areas in Lilypad Bay.
- Repairing and resurfacing the road in Segment 3 at its existing width.
- Improving parking areas and pullouts adjacent to the road.
- Upgrading signs, striping, guardrails, and other safety-related features.
- Implementing environmental commitments to reduce or mitigate environmental impacts.

1.2 PURPOSE

The three primary reasons to construct one of the build alternatives are:

- To maintain an efficient transportation link between the City of Coeur d'Alene and IPNF at Fernan Saddle that safely accommodates traffic projected through 2026.
- To upgrade stormwater treatment along Fernan Lake Road to protect water quality in Fernan Creek and Fernan Lake.
- To provide a roadway that can be reasonably maintained in a sustainable manner by ESHD.

The following sections describe the need for improvements to Fernan Lake Road that led to the proposed project. The need for improvements was identified by the partner agencies in nominating the road to the Forest Highway Program.

Transportation Needs

Safety Concerns

Fernan Lake Road is considered to have a dangerous mix of users. Bicyclists, pedestrians, cars, recreational vehicles, timber haulers, trucks, and buses all using the same narrow roadway. Safety hazards are created by a narrow road with sharp curves and a surface that is in poor condition (ITD, 1993).

Accident data from the ITD database was obtained to evaluate accident rates and to determine whether accidents occur more frequently in specific locations. The accident database listed 33 accidents between January 1, 1992, through December 31, 2001. Table 1-1 summarizes accident data by year.

The number of reported accidents per year ranged from none (1992) to eleven (2001). There may have been other, unreported accidents. Unreported accidents typically involve minor damage to vehicles and rarely involve injuries. Accident rates have been higher in more recent years, as use of the road has increased.

Table 1-1. Accident Summary by Year (January 1992 through December 2001)

	Total				Segment 1				Segment 2				Segment 3			
Year	Sum	Fatal	Inj	PDO	Sum	Fatal	Inj	PDO	Sum	Fatal	Inj	PDO	Sum	Fatal	Inj	PDO
1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	2	0	1	1	1	0	1	0	1	0	0	1	0	0	0	0
1994	2	0	0	2	2	0	0	2	0	0	0	0	0	0	0	0
1995	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0
1996	6	0	3	3	4	0	3	1	2	0	0	2	0	0	0	0
1997	4	2	1	1	4	2	1	1	0	0	0	0	0	0	0	0
	Total				Segment 1				Segment 2				Segment 3			
Year	Sum	Fatal	Inj	PDO	Sum	Fatal	Inj	PDO	Sum	Fatal	Inj	PDO	Sum	Fatal	Inj	PDO
1998	3	0	0	3	3	0	0	3	0	0	0	0	0	0	0	0
1999	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0
2000	3	0	0	3	3	0	0	3	0	0	0	0	0	0	0	0
2001	11	0	4	7	6	0	2	4	1	0	1	0	4	0	1	3
Total	33	2	11	20	23	2	7	14	6	0	3	3	4	0	1	3

Sources: ITD, 2001; State of Idaho, 2001.
PDO = Property damage only.

Almost 80 percent of accidents (26) were single-vehicle and were caused by the driver losing control and running off the road. Four of the seven multi-vehicle accidents involved one vehicle sideswiping another vehicle traveling in the opposite direction.

The severity of the accidents varied. About two-thirds of the accidents were non-injury accidents resulting in possible property damage. Of the 33 accidents, there were eleven with injuries and two with a single fatality each. Both fatal accidents were caused by the driver losing control and/or running off the road.

Most of the time, climatic conditions were not a contributing factor to the accidents. In 70 percent of the accidents, the roadway surface was dry, and in 58 percent of those with known times, the accidents occurred during daylight hours.

More than half of the accidents on Fernan Lake Road occurred near sharp curves (Figure 1-2). Accident reports indicate that most of the accidents were caused by the driver exceeding the speed limit and/or traveling too fast for road conditions. In the accidents near sharp curves, it appears that drivers were unable to negotiate the curves at their speed. Segment 1, along the lake, had significantly higher accident rates than the two other segments of the road proposed for improvement, and rates higher than the statewide average for rural roads.

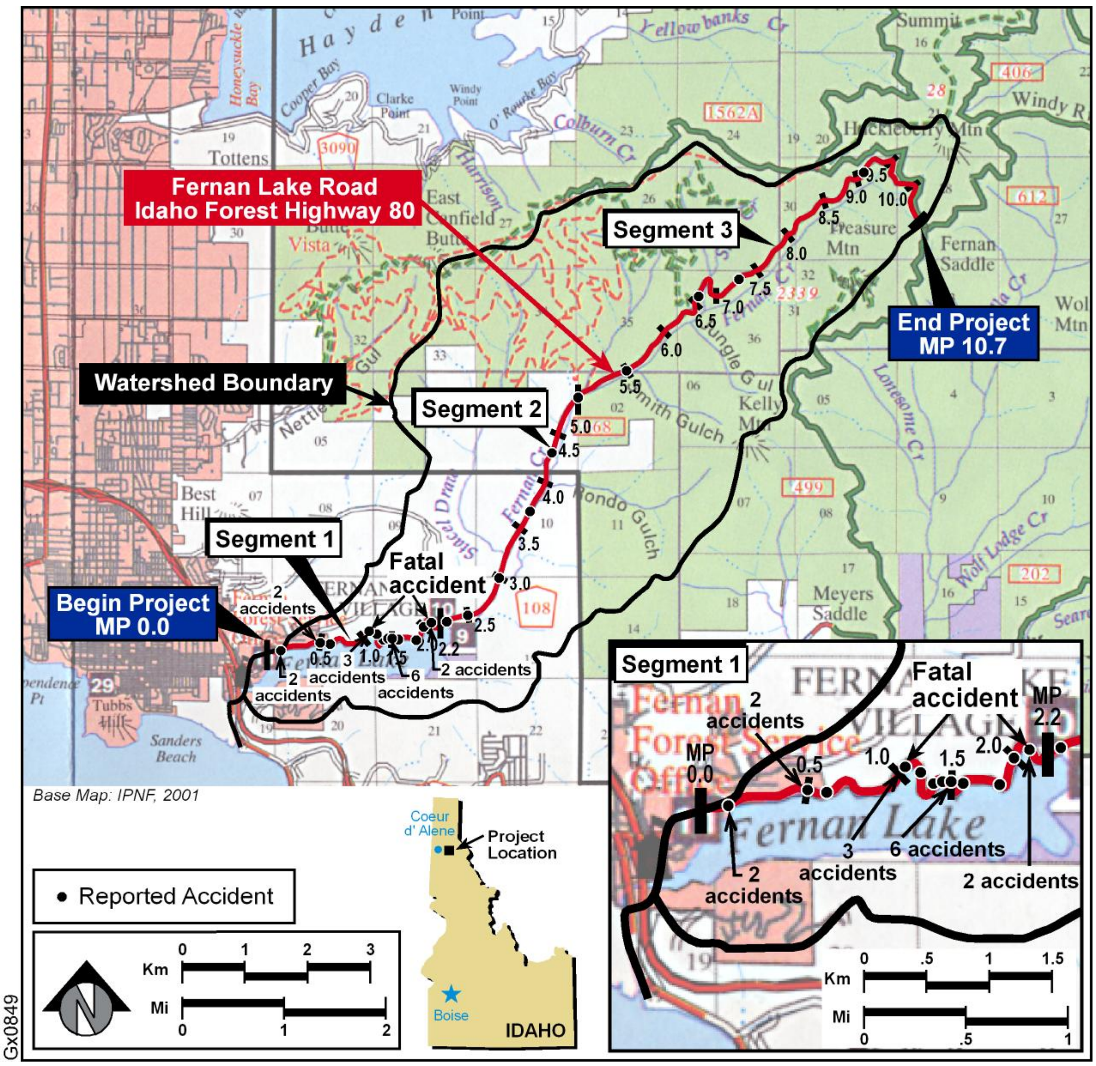

Figure 1-2. Distribution of Reported Traffic Accidents

Table 1-2 shows accident rates by segment in comparison to the statewide rate for rural roads.

Table 1-2. Average Accident Rates

Road Segment	Accident Rate	Injury Rate	Fatality Rate
Segment 1	5.32	1.47	0.50
Segment 2	0.78	0.78	0.00
Segment 3	1.93	0.48	0.00
Statewide Average	1.61	0.63	0.02

Source: ITD, Office of Highway Safety, 2001

Six locations had two or more accidents. Circumstances for each accident at these locations were similar. All of the multiple accident locations occurred where there were sharp curves in the roadway or where there was a driveway entrance.

Traffic Volumes

Classification

Fernan Lake Road is classified as a Rural Major Collector under the functional classifications defined in the American Association of State Highway and Transportation Officials (AASHTO) Policy Manual and according to the Kootenai County Area Transportation Plan (KCATP) adopted in 1998. These roads carry traffic that is primarily of intra-county rather than statewide importance, serve traffic generators of intra-county importance (e.g., schools, county parks and important mining or agricultural areas), and link these places with nearby larger towns or cities. Operating speeds are in the 40 to 48 km/h (25 to 30 mph) range. Parking along the roadway is acceptable but may be limited.

Existing and Projected Traffic Volumes

Information about traffic volumes and the mix of vehicles making up the traffic is used to determine the design standard for road improvements. Roads that carry low traffic volumes can be narrower and still safely serve travelers. As traffic volumes increase, and the percentage of trucks, bicycles, etc. increases, then the roadway must be wider to safely accommodate the higher volumes and greater mix of vehicle types.

Detailed information about the traffic in the study area was collected in July 2001 (Table 1-3). ITD conducted weekday traffic counts that included total volumes, commercial vehicle volumes and travel speeds. ESHD and the FS had previously conducted less detailed counts. ESHD collected data intermittently over the four years on Segments 1 and 2, and the FS counts traffic every year inside the IPNF boundary. ESHD and FS volumes represent the average total two-way traffic during a 24-hour period.

Table 1-3. Baseline (2001) Traffic

Date	Measured volume	Seasonal adjustment factor	AADT		Peak seasonal volume		Design-hour volume
			Total volume	Commercial volume	Total volume	Commercial volume	
Segment 1							
23 Jul 01 – 24 Jul 01	844	139%	605				
24 Jul 01 – 25 Jul 01	858	139%	615				
3 May 01 – 10 May 01	839	97%	865				
Weighted average			810	31 (3.8%)	1,125	43 (3.8%)	120
Segment 2							
23 Jul 01 – 24 Jul 01	513	144%	355				
24 Jul 01 – 25 Jul 01	523	144%	365				
3 May 01 – 10 May 01	439	97%	450				
Weighted average			430	21 (4.8%)	610	29 (4.8%)	65
			Total volume	Commercial volume	Total volume	Commercial volume	
Segment 3							
24 Jul 01 – 25 Jul 01	355	152%	235				
12 Jul 01 – 3 Dec 01	227	130%	175				
Weighted average			175	6 (3.5%)	265	9 (3.5%)	25

Note: Calculations are described in the Traffic Report (DEA, 2003)

Although Fernan Lake Road is used by recreation traffic throughout the year, traffic volumes vary month to month. Summer months typically see higher volumes with more recreational usage during both weekdays and weekends. Winter months typically see lower volumes with most recreational activity occurring on weekends.

Kootenai County projected future traffic growth for much of the county using forecasted future population, employment, and land-use estimates as part of the KCATP development process. However, no traffic volume projections were reported along Fernan Lake Road. This EIS assumes that the traffic on Fernan Lake Road will grow at the same rate as other similar roads in KCATP projections – that is, 2.5 percent per year. Table 1-4 summarizes total traffic and commercial vehicle forecasts based on population growth forecasts. Annual average daily traffic (AADT), peak season and design-hour volumes were projected based on this analysis.

Table 1-4. Estimated 2026 Traffic Volumes

	AADT[1]		Peak season[2]		Design-hour[3]
Location	Total	Commercial	Total	Commercial	Total
Segment 1	1,500	57 (3.8%)	2,085	79 (3.8%)	225
Segment 2	795	38 (4.8%)	1,145	55 (4.8%)	120
Segment 3	325	11 (3.5%)	495	17 (3.5%)	50

1. AADT volumes are estimated based on an average annual growth rate of 2.5% per year.
2. Peak season traffic volumes represent average July traffic conditions. Seasonal factors are assumed to be 139% on Segment 1, 144% on Segment 2, and 152% on Segment 3.
3. The DHV is assumed to be 15% of ADT, in accordance with AASHTO guidelines.

For Fernan Lake Road, the projected future traffic volumes will increase substantially over current volumes by 2026. The current design of Fernan Lake Road, already unsafe is some portions, will become even more dangerous as traffic increases. In addition, the increased traffic in the future will result in an increased rate of road surface deterioration.

System Linkages

Fernan Lake Road is the western leg of an existing FS loop road that provides primary access to IPNF Coeur d'Alene River Ranger District. The 125-km (75-mi) loop road consists of Forest Highway 80 (Fernan Lake Road), Forest Road 612, Forest Road 209, and Forest Highway 9 (Figure 1-3). I-90 between Kingston and Coeur d'Alene (Exits 43 and 15, respectively) completes the remaining 47 km (28 mi) of the loop. This loop is a popular afternoon drive during good weather, and it has the highest road use in the ranger district. Because it is closest to the population of Coeur d'Alene, Fernan Lake Road sees the highest usage of the FS roads that make up the loop.

Forest highways 80 and 9 are paved, but a 41-km (24.6-mi) portion of forest roads 612 and 209 is not. Improvement of the unpaved portion of the loop road is contingent on FS funding availability and environmental clearance. No such improvements are currently proposed or scheduled, and thus they do not represent cumulative effects to the proposed Fernan Lake Road improvements.

Roadway Condition

The existing Fernan Lake Road is narrow, has numerous sharp curves, a soft subgrade, a cracking road surface, and substandard horizontal alignment that limits sight distance ("blind curves"). There are no developed recreational parking areas and very few turnouts along Fernan Lake, so users park along the road, creating a safety hazard. Deficiencies are described below for each roadway segment. For discussion purposes, the road has been divided into three segments, as follows.

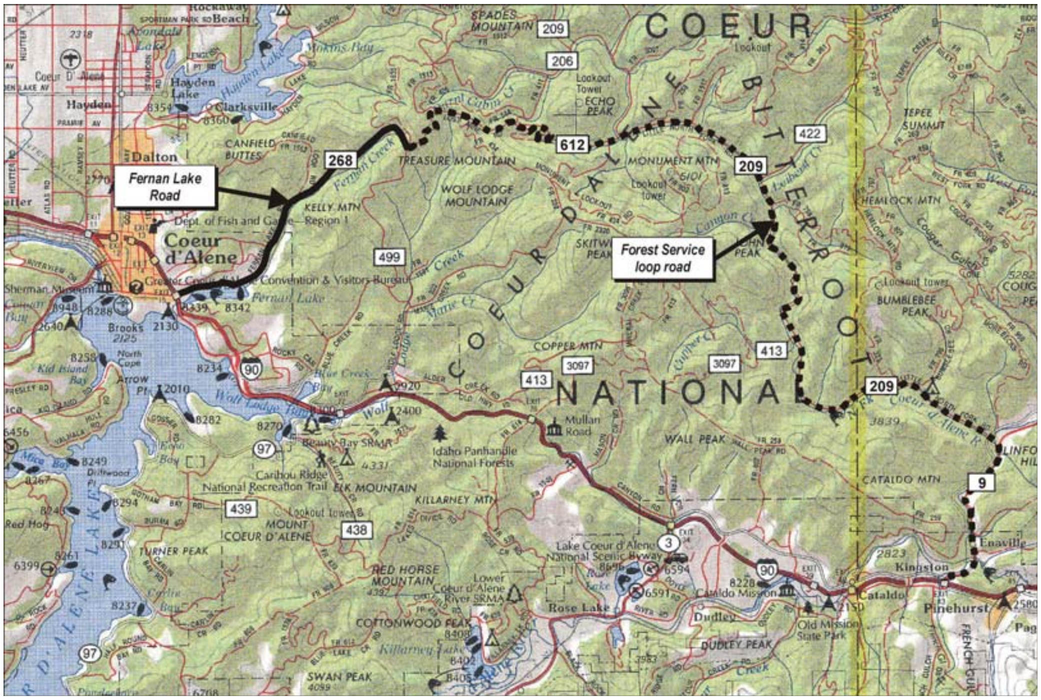

Figure 1-3. Forest Service Loop Road

Segment 1 -- Along Fernan Lake (MP 0.0 to MP 2.2)

The project begins at the eastern end of Fernan Lake Village approximately 0.7 km (0.4 mi) from the interchange with I-90. The road follows the northern edge of Fernan Lake, with the lake to the south and the steep slopes of Fernan Hill to the north. The road has no shoulders and very few narrow turnouts for parking. The lake is a popular location for fishing and boating during much of the year, but parking is very limited. Public safety is compromised when visitors park along the road, and in some cases, on the roadway itself.

In some areas, original construction of the road required cutting into argillite rock outcrops. These outcrops are degrading, and there are occasionally significant debris deposits within the roadway, requiring removal.

Poor drainage conditions and a soft subgrade have resulted in subgrade failure in several locations along the lake. Continued maintenance is required due to cracking of the road surface. The close proximity of the road to the lake edge may have exacerbated this problem, either due to the lack of lateral support or (less frequently) water infiltration.

Poor horizontal alignment does not allow sufficient sight distance for travelers and residents whose driveways access the road. Curve radii are as narrow as 30 m (98 ft) in some locations. Eight curves are tighter than desirable for the typical travel speed on the road.

Much of the road in Segment 1 is immediately adjacent to the lake at an elevation only a few feet above the water surface. Portions of the roadway are below the 100-year flood elevation (Figure 1-4). Construction of the road required cutting into the terrain in some locations.

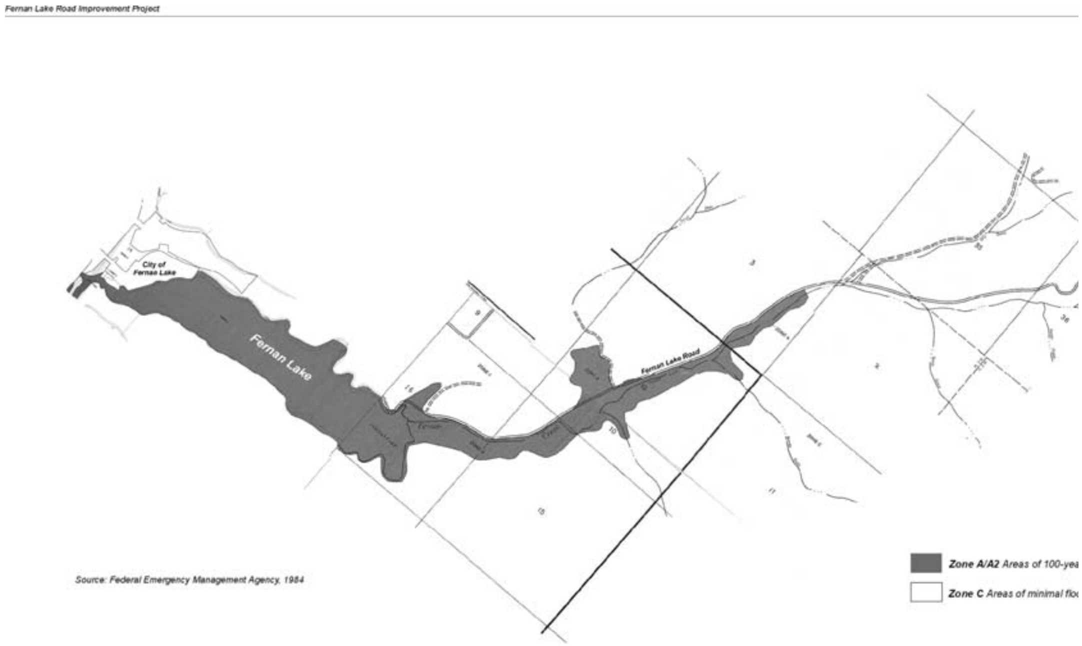

Figure 1-4. FEMA 100-year Floodplain

All of Fernan Lake Road is currently subject to load restrictions in spring and fall during freeze/thaw periods. During these breakup periods, which can last as long as two months, logging trucks and other heavy vehicles are prohibited. Load restrictions are based on the need to limit damage to the road and pavement during breakup periods and are determined by the ESHD.

At the eastern end of Fernan Lake, the road crosses wetlands in Lilypad Bay that are associated with unnamed creeks coming down from Fernan Hill. The culverts beneath the road have silted in and no longer provide unrestricted drainage flow for the creek. The road has subsided along the lake edge in this location and even with subsequent repairs, still retains a noticeable dip.

Segment 2 -- Along Fernan Creek Valley (MP 2.2 to MP 5.0)

At about MP 2.2, Fernan Lake Road leaves the lake and parallels Fernan Creek separated by a strip of wetlands that varies in width. For approximately 2.9 km (1.8 mi), the road follows the creek channel closely. It appears that landowners have altered the stream channel, directing the flow adjacent to the road in some places, in order to maximize useable agricultural area. In two places, the creek meanders across the valley floor.

There are no shoulders and few turnouts in Segment 2. Turnouts were not designed as part of the road, but have been created by users over the years.

The roadway between approximately MP 3.2 and MP 3.4 in Segment 2 is below the 100-year flood elevation. Segment 2 has a soft, low-strength subgrade that is subject to frost heaving, which has resulted in cracking and other damage to the asphalt surface. As a result, this segment of the road is subject to load restrictions in spring and fall, as described for Segment 1.

There are many degrading cut slopes in Segment 2 (as in Segments 1 and 3), that are sloughing debris into the roadway. Frequent maintenance is required to keep the rocks off the pavement.

Segment 3 -- Within the IPNF (MP 5.0 to MP 10.7)

The third segment is located entirely within the boundaries of the IPNF. Elevation increases sharply between MP 5.0 and the summit at MP 10.7 (Figure 1-5). The road was built with steep cut and fill slopes, and there is no guardrail or shoulder and few turnouts.

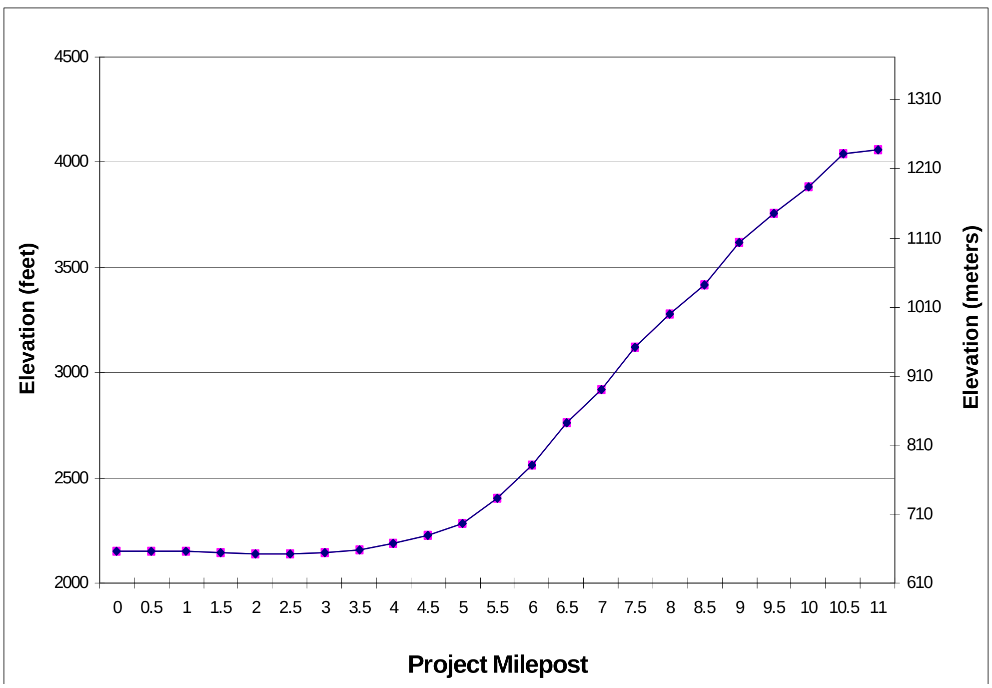

Figure 1-5. Vertical Profile of Fernan Lake Road

Drainage along most of this segment of Fernan Lake Road comes off the steep slopes (both natural and cut slopes) on the west side of the road. Flow must either cross the road or be captured by storm drains and channeled under the road. In some cases, existing drainage facilities are inadequate or have been damaged. Drainage inlet pipes intended to collect runoff and snow melt on the west side of the road have been damaged by falling rocks from the degrading cut slope above it. Most inlet pipes are rusted.

Segment 3 also has many cut slopes in rock formations that are now degrading. In addition to creating safety hazards from rocks sloughing onto the pavement, debris fills up drainage ditches on the west side of the road and reduces drainage capacity in the ditches.

Without improvements to Fernan Lake Road, the deficiencies identified for the three segments would become more severe, both over time and with increased traffic volumes. Improvements to the sub-grade, drainage capacity, drainage facilities, cut slopes, asphalt surface, culverts, etc., are needed to correct the existing road deficiencies.

Maintenance Needs

ESHD expends a great deal of both time and money trying to maintain Fernan Lake Road. Maintenance is needed more frequently than typical because of the degrading cut slopes, soft subgrade, cracking of the road surface, and heavy use of the road. These road deficiencies result in environmental degradation (untreated runoff and sedimentation into streams and the lake) as well as safety issues for drivers and recreational users.

As traffic volumes increase over time, and unless the root causes of the need for maintenance are addressed, the maintenance needs of the roadway will only increase. However, budget restrictions limit the amount of maintenance that ESHD is able to provide for the road. These budget restrictions are not likely to change in the future.

The cost of maintenance to ESHD would be reduced as a result of this project. Improvements to the subgrade, drainage capacity, drainage facilities, cut slopes, asphalt surfaces, culverts, etc. would reduce the amount of time and money spent for maintenance along the project. Surface repairs would be needed less frequently and clearing of rocky debris from disintegrating cut slopes would not be required as often. An improved roadway would require less time and money to maintain.

Environmental Needs

Fernan Lake Road crosses very scenic and environmentally sensitive areas as it climbs from Fernan Lake Village to Fernan Saddle in the IPNF. The corridor includes the aquatic habitat of the lake, the extensive wetlands system in Fernan Creek valley and the montane forests of the IPNF. These diverse habitats are rich in wildlife. The road passes through rock slopes and ranchland as well. Fernan Lake Road offers scenic views across the lake and of the surrounding hillsides to the south that many visitors as well as area residents enjoy.

The sensitivity of the area to impacts created by the project must be considered. As a part of the project, an extensive information gathering effort was undertaken to identify environmental issues and concerns that must be taken into account in the design of any safety improvements. Five key issues were identified: geology, topography, and soils; water quality; plants and habitats; fish and wildlife; and the recreational uses of the area.

Geology, Topography, and Soils

Fernan Lake and the area of potential effect for the project are located in the Coeur d'Alene Basin. This area is characterized by steep slopes (10 to 40 percent on ridges and up to 60 percent along draws). The road climbs from an elevation of approximately 655 m (2,150 ft) at Fernan Village to 1,237 m (4,061 ft) at Fernan Saddle (Figure 1-5).

The steep mountainous terrain and the original methods of road building have created numerous steep and unvegetated cut slopes along the road. The predominant rock found in cut slopes along this road is argillite. Although the rock is fairly hard, the road crosses bedding planes in some sections at an angle that inclines directly toward the road. The soils and geologic formations in the project area are eroded and there are several degrading cut slopes along the existing roadway. Rock fall on the roadway poses a threat to the safety of drivers until detected and removed by county maintenance crews. Wider ditches should be provided in some locations along the road to catch these rocks before they reach the roadway.

In recent years, lot development on Fernan Hill triggered a landslide that impacted local utilities. Additionally, a major landslide associated with a road project dumped massive quantities of sediment in Coeur d'Alene Lake.

Water Quality

For the first 2.2 miles of the project, Fernan Lake Road is located immediately adjacent to the lake. From MP 2.2 to approximately MP 4.0, the road parallels or crosses wetlands in the Fernan Creek valley. Currently, the road has no stormwater quality treatment facilities, and run-off from the road and adjacent cut slopes flows directly into the lake or creek.

Many of the slopes along Fernan Lake Road are too steep and unstable to establish or retain vegetation. The existing steep, unvegetated cut slopes above the road erode during storms, allowing soil and rock to reach the roadway and enter streams and the lake. Vegetation between the road and the lake has been trampled by anglers, leaving the soil bare and subject to erosion. Soil erosion also results in the loss of important topsoil and destruction of mature vegetation. Water quality concerns led to the recent development of a management plan for Fernan Lake and its watershed (FLWTAC, 2003).

Agricultural activities in Segment 2 have disturbed or removed riparian vegetation, and in places landowners have reconfigured the stream channel. These alterations increase the likelihood of stream bank erosion and sediment transport to the lake. According to IDEQ studies, stormwater runoff and riparian disturbance along Fernan Creek appear to be the major sources of nutrient and sediment input into Fernan Lake. The lake is relatively shallow (average depth approximately 4.5 m) and has a strong susceptibility toward man-made eutrophication.

Stormwater runoff treatment facilities such as vegetated swales and sediment basins would reduce the amount of sediment entering streams and the lake. Treating cut slopes to permit revegetation would provide additional protection from runoff and stabilization of riparian stream habitat, both of which are essential to maintaining good water quality and fishing/recreational opportunities in Fernan Lake.

Plants and Habitats

Fernan Lake Road crosses a wide variety of habitats as it climbs from the shores of the lake to the saddle, but much of the project corridor passes through second growth Douglas fir (*Pseudotsuga menziesii*) forest. In addition, there is white alder (*Alnus incana*)/Douglas spirea (*Spiraea douglasii*) wetland, mountain maple riparian forest, and herb-dominated communities on rock outcroppings along the route.

Suitable habitat is found in the area for two federally listed threatened plant species, Ute ladies' tresses (*Spiranthes diluvialis*) and water howellia (*Howellia aquatilis*) as well as one species that is proposed for listing as threatened, Spalding's catchfly (*Silene spaldingii*). In addition, 31 species that the FS considers sensitive and 22 FS Species of Concern may occur along the route. The habitats along the road where sensitive species could occur are currently impacted by the continued erosion and sedimentation from unvegetated cut slopes and from the road itself. Federal law mandates avoiding impacts to listed species or their habitat if at all possible. Proposed road improvements would include stormwater quality treatment facilities (e.g., vegetated swales, sediment basins) and revegetation of existing and new cut slopes. This would reduce sedimentation of wetland, riparian and aquatic habitat for sensitive species and revegetate degraded areas.

Fish and Wildlife

The project area supports a wide variety of wildlife, including species listed as threatened or endangered under the Endangered Species Act (ESA). There is a bald eagle (Threatened) nest on the lake and the area is rich in migratory birds. The USDI Fish and Wildlife Service (FWS) and FS consider that suitable habitat is present in the area for gray wolf (Endangered), Canada lynx (Threatened) and grizzly bear (Threatened), but there are no known populations of these species currently in the watershed. In addition, there is suitable habitat for one fish species listed as Threatened under the ESA, the Bull trout *(Salvelinus confluentus*), although the Fernan drainage no longer contains the species nor is it designated as critical habitat for recovery of the species. There is also suitable habitat for two IPNF sensitive fish species; torrent sculpin (*Cottus rhotheus*) and west slope cutthroat trout (*Onchorhynchus clarki*). Suitable habitat occurs for twelve IPNF sensitive wildlife species. Residents and visitors to the area report that the presence of wildlife is one of the most attractive features of the area.

The quality of the lake and wetland habitat is currently threatened by erosion from existing unvegetated cut slopes along the road as well as runoff from the road itself. Proposed road improvements would revegetate cut slopes to reduce erosion and provide water quality treatment for storm water runoff so that contamination of the lake, streams, and wetlands would be reduced over current levels.

Needs of Existing and Planned Land Uses

Fernan Lake Road is the primary recreational access to Fernan Lake. It also provides access to residences, an established shooting range, and approximately 500,000 acres of the IPNF, which includes campgrounds, picnic areas, and snowmobiling and hiking trails in Dry Gulch, Jungle Gulch, Kelly Mountain, Huckleberry Mountain, Canfield Butte and Treasure Mountain.

Based on actual traffic counts made by the FS just above the shooting range, Fernan Lake Road recorded about 100,000 Recreation Visitor Days (RVD) in 1998. In 1999, this number increased to 107,000 RVDs. There has been a steady increase in the number of visitors over the past 12 years, roughly doubling between 1989 and 1999. Because these numbers are based on IPNF use only and do not include recreational users of the road below the IPNF boundary (where Fernan Lake fishing and boating activities occur), the actual number of recreational visitors using this road is probably considerably higher.

Suburban and rural residential uses predominate in Segments 1 and 2, and the Kootenai County Comprehensive Plan anticipates that these will continue to be the primary private land uses along the road. Residential traffic currently represents an average of 200 trips daily. This is 25 percent of the traffic on Segment 1 and 15 percent of the trips on Segment 2. These proportions are anticipated to remain constant (DEA, 2003).

The mix of traffic using the route includes cars, trucks, buses, logging trucks, recreational vehicles, motorcycles and bicycles. Fernan Lake Road is a major access road to snowmobiling areas as well as fishing, hunting, camping, hiking, picnicking, woodcutting, and huckleberry picking. Although the largest single traffic generator on Fernan Lake Road is opening day of hunting season, use of the road and the IPNF is year round. The road serves the Honeysuckle and Bumblebee campgrounds with a total of 38 camp sites, three campgrounds farther into the IPNF (each with more than 35 camp sites), the Shoshone Dump Station and Magee Historic Site (each with picnic facilities), and more than 250 km (156 mi) of snowmobile trails. In addition, there is unlimited, undeveloped camping and picnicking throughout this portion of the IPNF.

The Fernan Rod & Gun Club operates a shooting range under a special use permit from IPNF adjacent to Fernan Lake Road at approximately MP 5.3. Approximately 3,000 to 4,000 visitors are estimated to use this facility annually. Use increases in the late summer and fall around hunting season. The Fernan Rod & Gun Club is planning to build a new facility that will serve as a joint civilian, military and police firing range on the site of their current special use permit.

Currently there are few places for visitors to park along Fernan Lake Road, so parking occurs on the roadway itself. There are no bike lanes or pedestrian paths either. As a result, bikes share the roadway with cars, recreational vehicles, and logging trucks. Anglers stand or walk along the roadway as they fish. As the number of recreational users of Fernan Lake, private facilities (gun range, etc.) and FS facilities increases over time, additional pressure will be placed on Fernan Lake Road for parking and access to adjacent recreation, creating safety hazards for all road users. Improvements to Fernan Lake Road would provide off-road parking and safe access.

1.3 PROJECT OBJECTIVES

The overall purpose of the project is to improve, reasonably and cost effectively, the safety of Fernan Lake Road, while minimizing adverse impacts to sensitive environmental resources. Project objectives were determined based on the needs identified in the previous sections of this chapter. The following project objectives carry equal weight in evaluating alternatives and selecting appropriate actions. Project alternatives must meet these objectives reasonably and cost effectively.

Transportation Objectives

1. Improve access to the IPNF from the Coeur d'Alene area.
2. Improve the safety for current and future travelers, including bicyclists, by providing a consistent roadway geometry and safety features such as guardrail, signs and striping to alert motorists to potential hazards.
3. Provide a roadway width and surface capable of safely accommodating existing and projected 2026 traffic.

Maintenance Objectives

4. Provide roadway improvements that reduce road maintenance costs.
5. Repair existing roadway deficiencies (soft subgrades, inadequate drainage, degrading cut slopes etc.) to reduce maintenance frequency and cost.

Environmental Objectives

6. Repair unstable side slopes to reduce sedimentation of streams and the lake and allow revegetation.
7. Avoid, minimize or mitigate long-term adverse impacts of the road to the environment. Protect sensitive species and habitats. Minimize short-term adverse impacts from road improvements.
8. Correct roadway drainage problems and protect the water quality of Fernan Lake and Fernan Creek.

Land Use and Recreation Objectives

9. Provide off-road parking for recreational users to enhance their safety.
10. Improve recreational lake access and protect the area from harm as a result of recreational use.
11. Minimize right-of-way acquisition, particularly through private land.
12. Comply with applicable guidelines from the IPNF Forest Plan and Kootenai County plans and ordinances.

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2.0 ALTERNATIVES

This chapter describes four alternatives, including the No Action Alternative, considered in detail in this EIS. How the build alternatives were developed is described, as is selection of the Preferred Alternative. Also discussed are alternative routes that were considered but not carried forward for detailed analysis.

2.1 ALTERNATIVE DEVELOPMENT

The alternative development process for this project included determining major public and agency issues and concerns, identifying appropriate design criteria, evaluating alternative routes that avoided all or part of the existing Fernan Lake Road, and using the Interactive Highway Safety Design Model (IHSDM) for rural two-lane roads in the final evolution of the build alternatives analyzed in this EIS.

Major Issues

FHWA held several meetings with the public, partner agencies, and regulatory and resource agencies to identify the issues and concerns associated with the proposed project. The scoping process is described in greater detail in Chapter 6. Major issues identified by the public and agencies include:

1. Changes in safety and traffic operations, especially in Segment 1 where most accidents have occurred.

2. Changes in water quality of Fernan Lake.

3. Encroachment of road features into Fernan Lake.

4. Potential for landslides related to construction on steep slopes, including changes in sediment loading to Fernan Lake.

5. Changes in recreation access and scenic qualities along the road corridor.

6. Changes in cultural resources along the road that are eligible for listing in the National Register of Historic Places.

7. Changes in wetland amount, function, and value.

8. Changes in fish and wildlife habitat and populations, particularly those listed under the Endangered Species Act.

9. Changes in traffic volumes, development patterns, and right-of-way (ROW) requirements related to the proposed road improvements.

The following sections briefly describe these issues. Many issues are also reflected in the project objectives presented in Chapter 1.

Traffic Safety and Operations

More accidents and fatal accidents have occurred on Fernan Lake Road, especially in Segment 1 along the lake, than is typical of rural roads in Idaho. Thus improving safety is a primary purpose of the project. Residents along the lake expressed concerns that proposed improvements would promote faster traffic and make driveway approaches to the road more dangerous than they currently are. There are also safety concerns resulting from the lack of well-defined parking areas and bike or pedestrian lanes along the road.

Lake Water Quality

Fernan Lake is a popular destination for many uses because it is close to Coeur d'Alene and easily accessed from I-90. But the lake is shallow, relatively small, and often experiences blooms of blue-green algae in summer. Any activities that might increase nutrient loading to the lake could create an undesirable trophic state and worsen water quality.

Lake Encroachment

Because Fernan is not a large lake, substantial additions of riprap or fill into the lake to widen the road or improve its curves would cause a proportionately greater reduction in lake volume than might otherwise be the case. This in turn could make the lake more susceptible to a deterioration of trophic state and water quality. Encroachment by riprap and retaining walls could make bank fishing more difficult. Ongoing encroachment by fill for the current roadway across Lilypad Bay is a concern because there is poor water exchange through its culverts.

Construction on Steep Slopes

For most of Segment 1 (MP 0.0 to MP 2.2) and part of Segment 2 (MP 2.2 to MP 5.0), there would be substantial cuts into the existing steep slopes and/or construction of retaining walls along the road corridor to allow for the wider road, safer curves, and stormwater treatment. In recent years, lot development on Fernan Hill triggered a landslide that impacted local utilities. Additionally, a major landslide associated with a road project dumped massive quantities of sediment in Coeur d'Alene Lake. The recent Fernan Lake Watershed Management Plan (FLWTAC, 2003) recommended against developments on slopes greater that 35 percent. The City of Coeur d'Alene adopted this recommendation.

Recreation Access and Scenic Qualities

Opportunities for a wide range of recreational activities exist along or are accessible from Fernan Lake Road. These include fishing, boating, water/jet skiing, bicycling, walking/running, hiking, bird watching, berry picking, snowshoeing, cross-country skiing, ATV use, hunting, camping and snowmobiling. Fernan Lake Road passes through or along a wide variety of habitats as it climbs from the shores of Fernan Lake to Fernan Saddle. Much of the project corridor passes through a second growth Douglas-fir forest. Steep slopes above Fernan Creek are sparsely vegetated with scattered Douglas fir, western white pine, western larch, ponderosa pine, grand fir, western red cedar, and mountain maple. Distinct plant communities occur along the project corridor.

Cultural and Historic Resources

Prehistoric or Native American historic properties may include archaeological sites that represent residential areas, campsites, lithic scatters, resource processing locations, petroglyphs, pictographs, hunting blinds, stone cairns, or burial locations. Also important are places or resources that have traditional cultural importance to contemporary American Indians now represented by tribal governments. Particularly important are cemeteries and isolated interments, sacred landforms, ceremonial sites, rock art, cairns, certain animal and plant resources, and locations prominent in mythology and tribal history. Other cultural remains represent the activities of Euroamericans in the region for the last two centuries. These remains include buildings, structures, and sites associated with agriculture and settlement (e.g., homesteads, irrigation systems, fences, corrals), mining (e.g., tunnels, tailings, mills, camps), logging (e.g., mills, spur railroads, camps, equipment), the development of regional transportation (e.g., roads, railroads, associated construction camps, maintenance facilities), and federal administration (e.g. U.S. Forest Service roads, trails, ranger stations, lookouts, experimental stations, other facilities).

Wetlands

Fernan Creek and Fernan Lake are the major hydrological features in the vicinity. The wetlands in Segment 1 are located to the north of Lilypad Bay and the road fill that crosses it. Wetlands in Segment 2 are associated with Fernan Creek. Fernan Creek and runoff from the east hillside provide hydrology for the wetland areas and often are immediately adjacent to the road. Wetland impacts are unavoidable if the existing road is improved, so minimizing and mitigating these impacts are a concern.

Fish and Wildlife

Wild cutthroat trout, brook trout, and stocked rainbow trout account for over 40 percent of the catch in Fernan Lake with warm-water species, including largemouth bass, catfish, crappie, perch, and northern pike accounting for the rest. Two native, wild fish species exist in the project area (torrent sculpin and west slope cutthroat trout). A small portion of the Fernan Creek watershed consists of mature forest, which is suitable habitat for northern goshawk and pileated woodpeckers. In addition white-tailed deer, moose, and elk inhabit the Fernan Creek watershed. There has been an active and productive bald eagle nest on the south shore of Fernan Lake for several years.

Land Use and Right-of-Way

Land uses abutting Fernan Lake Road are suburban residential and recreation in Segment 1 and agricultural (grazing) and rural residential in Segment 2. Segment 3 is located entirely within the IPNF. Segment 3 uses include, timber harvesting, hunting, recreation (a shooting range), and National Forest-related activities such as trails for year-round hiking and all-terrain vehicle (ATV) and snowmobile use. In Segments 1 and 2 Fernan Lake Road is located on an 18.3-m (60-ft) wide easement that for the most part overlays existing private lots along the route.

Design Criteria Options

The build alternatives have been developed for a forest highway that accommodates single-unit vehicles (e.g., motor homes, mini-buses). The design speed would vary along the length of the road. For Segment 1, along the lake, the design speed is 40 km/h (25 mph). For Segments 2 and 3, through the Fernan Creek Valley and the National Forest sections of the road, the design speed is 60 km/h (35 mph). These design speeds are consistent with existing posted speeds and the character of the road.

1. Roadway Width

The roadway top width (outside shoulder edge to outside shoulder edge) would typically be 7.4 m (25 ft) for the portions of the project that would be reconstructed, that is, all of Segments 1 and 2. The roadway width was selected based on IHSDM results, which showed that preliminary designs using the wider design standards of AASHTO and ITD were not safer for this road. In addition, drainage ditches, rockfall ditches, and guardrail allowances would be provided as needed along the length of the reconstructed segments of the road. The overlay of Segment 3 would match the existing roadway surface width (approximately 7.6 m [25 ft]).

2. Retaining Walls

Construction of the build alternatives would require new cut and fill slopes in Segments 1 and 2. Along the existing alignment, cut slopes would reach as high as 18 m (58 ft). In some cases, the underlying rock is stable and no retaining wall would be required. In other places, retaining walls are proposed to ensure slope stability or minimize the total area of disturbance.

Different types of retaining walls would be used, depending on the location and purpose of the wall. Fill-side retaining walls are used in areas where it is necessary to elevate the road, for example, where the road is currently below the 100-year flood elevation. Fill-side walls are also used when it is necessary to widen the road on a down-sloping hillside where an embankment fill would not be appropriate, for example, adjacent to the lake.

In areas where cut slope retaining walls are needed, but there is very little room to widen into the slope, soil nail walls with a simulated stone, cast-in-place concrete face are proposed. The simulated stone surface is more attractive than a flat concrete wall, but it cannot be planted. As a result, the appearance would always be that of a man-made structure.

3. Guard rails

Guardrails would be installed in areas where steep drop-offs or other roadside hazards, such as Fernan Lake, exist. Installation of guardrail would add 1.0 m (3 ft) to the width of the roadway. In addition, AASHTO guidelines recommend a “shy distance” of 1.2 m from the edge of the travel lane, that is, a wider shoulder where guardrail is installed. In Segment 1, this offset has been limited to the 0.6 m (2 ft) shoulder.

4. Treatment of Curves

Safe curve design depends on the design speed selected and the width of the road. The existing road has curves with a very short radius, which are difficult to negotiate in larger vehicles or at higher speeds. In addition, the travel lanes are narrow and inconsistent in width with cut slopes and vegetation immediately adjacent to the curve. Some curves (particularly in Segment 1) have inadequate stopping sight distance (blind curves). Most accidents occur on these sharp curves.

The proposed design would provide a consistent radius (which is easier to negotiate) and includes widening the roadway at curves to provide additional room for maneuvering. Although all curves would be improved, there would still be some curves that do not meet AASHTO design standard for the design speed and lane width proposed for Segment 1. These curves were designed to provide maximum safety while minimizing impacts to the lake or the homes located adjacent to the road. Warning signs recommending a slower speed would be posted at these curves.

5. Drainage

The existing road has no or minimal drainage facilities (ditches, swales, detention/treatment basins, etc.). The proposed design would provide vegetated cut-side drainage ditches that would collect run-off, allow removal of contaminants and sediment before piping the run-off under the road to the lake or creek. These swales would add approximately 2 m (6 ft) to the width of the reconstructed roadway. On the cut slope side of the road, drainage swales would be combined with rock fall ditches to minimize disturbance of adjacent property. In areas where there is not sufficient room to provide a vegetated swale between the roadway and cut-slope retaining walls a drop inlet and piped system is proposed to collect and treat stormwater before discharging it to Fernan Lake. Vegetated swales would also be used on the fill slope side, between the roadway and the lake or creek in areas where there is sufficient room. In areas where there is not sufficient room to provide a vegetated swale, sheet flow across a vegetated slope planted to act as a water quality filter is proposed.

Interactive Highway Safety Design Model (IHSDM)

The Interactive Highway Safety Design Model (IHSDM) is road safety evaluation software that evaluates the potential safety impact of specific geometric designs for roads and highways. It combines elements of each of the four traditional methods of estimating current or future safety performance for a roadway into an crash prediction algorithm, minimizing the significant weaknesses of each of the traditional methods when used alone.

IHSDM was used to analyze preliminary designs for Alternatives B and D based on AASHTO and ITD design standards. Results predicted crashes would be reduced by 12 to 23 percent from existing conditions. The model was also used to evaluate the three build alternatives analyzed in this EIS. All three have narrower typical road width than AASHTO and ITD standards. They are predicted to reduce crashes by over 50 percent when compared to existing conditions, and by as much as 62 percent when compared to the No Action Alternative in the year 2026.

2.2 ALTERNATIVES ANALYZED IN THIS EIS

A great deal of effort on the part of the project partner agencies, the public, and regulatory agencies has been spent over the past several years to identify and evaluate alternative ways to meet the needs and achieve the objectives of the Fernan Lake Road Safety Improvement Project. A total of seventeen alternatives were identified by the agencies or the public. Seven closely follow the alignment of the existing road, and ten would follow other roads for much or all of the route to Fernan Saddle. Each alternative route was defined, and where possible mapped, although new road construction through NFS lands was not precisely mapped. Then a cross-functional team of FHWA staff and SEE team visited and reviewed the alternatives to assess the feasibility of making improvements, the potential impacts involved with each, and the extent to which each would meet the identified project objectives, described in Section 1.2 above.

FHWA conducted field review of preliminary designs with partner agencies.

Most of the alternatives that were evaluated would not meet the needs or address all project objectives. This was true of all of the alternatives that would have improved an alternate route and four of the alternatives following the existing road. This chapter describes the alternatives that are being evaluated for improvements to Fernan Lake Road, and documents the process of identifying and eliminating other alternatives from further consideration. Alternatives considered but eliminated from detailed evaluation are described in Section 2.5.

Four alternatives are being evaluated for improvements to Fernan Lake Road: the No Action Alternative and three build alternatives, E, Fm and G. The No Action Alternative is included both as a viable choice and for comparative evaluation as required by NEPA. The three build alternatives vary by location of the improvements, not by design standard (roadway surface width, drainage improvements, etc.).

All three build alternatives would substantially follow the existing Fernan Lake Road alignment. Preliminary designs for the three build alternatives primarily differ between MP 1.0 and MP 2.3 (Figure 2-1). Alternatives E and G differ in the location and configuration of the bridge proposed across Lilypad Bay. Otherwise both essentially follow the alignment of the existing road. Alternative Fm leaves the current alignment near MP 1.0, climbs the adjacent hillside, and while descending the hill, avoids Lilypad Bay by crossing this area farther to the north. Appendix A contains the preliminary design for Alternative G, which was determined by the SEE team to be the Preferred Alternatives, and those portions of Alternatives E and Fm that differ from Alternative G.

Figure 2-1. Build Alternatives between MP 1.0 and MP 2.3

Except for differences to accommodate the transition between Segments 1 and 2, Alternatives E, Fm, and G are very similar in Segment 2. All three raise the road profile above the 100-year flood elevation. The required widening of the road prism to accommodate the increase in road profile causes the road base to extend into wetlands and Fernan Creek channels that are immediately adjacent to the existing road. There is no difference among the three build alternatives in Segment 3.

Alternative E

Horizontal Alignment

Under Alternative E the road would be rebuilt to a typical 7.4 m (25 ft) width for the first 8 km (5 mi) and rehabilitated in Segment 3. In Segment 1 the proposed alignment remains curvilinear and essentially follows the existing alignment, mainly comprising back-to-back horizontal curves with the occasional short tangent length. Whenever possible, the horizontal alignment was developed so that the proposed edge of pavement line would not extend past the existing edge of pavement line on the lakeside of the road. This approach minimizes the impact to Fernan Lake. One substantial deviation from the existing alignment is near MP 2.0 (Station 13+100) where a 180 m (525 ft) bridge is proposed across Lilypad Bay, thereby eliminating three tight existing curves. In addition, a short section of clean jetty rock fill may need to be placed into the lake at approximately MP 1.05 (Station 12+060) to provide a base for the proposed roadway widening around this sharp curve.

There are two (2) curves within Segment 1 where physical constraints make it impractical to propose a roadway alignment that meets a minimum safe continuous operational speed for horizontal curves. The minimum radius for a 40 km/h (25 mph) design speed and using a maximum superelevation rate of 4 percent is 60 m (197 ft). Radii of 43.5 m (143 ft) and 30 m (98 ft) are proposed at approximate stations 12+100 and 12+450 respectively. The first curve at approximate Station 12+100 would require removal of a home or substantial filling into the lake to provide a 60 m (197 ft) radius curve. The second curve located at approximate Station 12+450 would require additional excavation in the vicinity of 36,000 m^3 (47,000 yd^3) and purchase of an additional 1900 m^2 (0.47 acres) of right of way or substantial filling into the lake to provide a 60 m (197 ft) radius curve. Therefore, the largest practical horizontal curves are proposed with the expectation that these curves would receive additional safety measures alerting motorists to the appropriate travel speed.

An alignment with a 60 m (197 ft.) radius curve at approximate Station 12+450 was reviewed with respect to both design consistency and crash prediction. The larger radius curve had no impact on design consistency. Both curves had nearly identical results. There is a slight reduction (approximately 1.8 percent for the corridor) in the predicted crash frequency with the larger radius curve. In the year 2026 the estimated collision frequency for Alternative E, Segments 1 and 2, is predicted to be 6.3 crashes per year. A 1.8 percent reduction, based on using the larger radius curve at Station 12+450, would reduce the estimated collision frequency by 0.1 collisions per year, for a total of 6.2 crashes per year.

There are several factors that may help mitigate the smaller than desirable radii for the two curves located at Station 12+100 and Station 12+450. On a 3-R project (Resurfacing, Restoration, and Rehabilitation) horizontal curves with radii within 20 km/h (12 mph) of the design speed of the roadway do not require the curve radius to be revised (enlarged), but they do require that all the safety features of the curve be reviewed as well as the accident history. There has only been one recorded accident for the curve at Station 12+100, attributed to driver error (failure to yield). Therefore the curve at Station 12+100 would be allowed to remain as is. In the vicinity of the curve located at Station 12+450 there have been a series of accidents. Between 1996 and 2000, there have been six recorded, non-injury accidents. The six accidents can all be attributed to driver error (four were speed too fast for conditions, one was exceeding the posted speed limit, and one was from improper parking). There are no changes that can be made that to the roadway geometrics that would force a motorist to limit their speed to match the roadway conditions.

Curve widening would be applied to all the curves in the alignment so that long wheel-based-vehicles would be able to drive the curves and remain within their own lane. Installation of guardrail is proposed along the outside of both of the curves. An additional benefit to these widened curves is that passenger type vehicles (cars and pickup trucks) would be able to follow a slightly larger radius through the curves. In addition, a short section of clean jetty rock fill may need to be placed into the lake at approximate Station 12+060 to provide a base for the proposed roadway widening around this sharp curve. Fill placement at this location was discussed with the resource and regulatory agencies during a field review.

The proposed horizontal alignment along the valley, Segment 2, was developed to minimize the impacts to wetlands and to minimize the amount of rock cut excavation on the west side of the roadway. It is anticipated that because of the proposed roadway alignment, realignment of two sections of the existing intermittent Fernan Creek, which flows through a manmade ditch immediately adjacent to the roadway, would be required. These two sections are between MP 2.8 and MP 3.0 (Stations 14+300 to 14+700), and MP 3.55 and 3.9 (Stations 15+600 to 16+100). The concept of realigning and restoring these stream reaches was discussed during a field review with resource and regulatory agencies, which indicated the upper reach should be higher priority.

Vertical Alignment

The proposed vertical alignment along Segment 1 was developed so that the catch points on the right hand side of the road would closely match the existing topography. Several sections of Segment 1 required that the proposed vertical profile be set below the existing ground centerline in order to accommodate a slightly wider roadway surface without adversely impacting the adjacent lake and hillside.

The horizontal limits of construction were developed using the cutslope design recommendations from the project geotechnical report (NTL, 2002). For fill areas or areas that were not completely covered by the NTL report, slope rates were applied that could reasonably be anticipated by the type of material (angle of repose) or slope rates that are necessary to allow an errant vehicle to safely traverse the slope (generally a 1:3 or flatter). The vertical profile was developed so that the pavement surface would remain at least 0.3 m (1 ft) above the predicted 100-year flood event, which was given as elevation 652.065.

The proposed vertical alignment in Segment 2 was developed in order to best match catchpoints on both sides of the road.

Alternative Fm

Horizontal Alignment

Under Alternative Fm the road would be rebuilt to a typical 7.4 m (25 ft) width and rehabilitated in Segment 3. The proposed alignment veers away from Fernan Lake between MP 1.0 and MP 2.1 (Stations 11+600 and 13+200) and proceeds up and across the adjacent hillside continuing to maintain a curvilinear nature. Alternative Fm then re-joins the existing alignment at approximately MP 2.1, where it predominately follows the existing alignment until reaching the end of Segment 2. In addition, a short section of clean jetty rock fill is proposed to be placed into Lilypad Bay near MP 2.1 (approximately Station 13+310 to Station 13+360) to provide a base for the proposed roadway widening. Placement of the clean jetty rock is necessary to avoid a major cut into the adjacent rock face, thereby preserving one or two potential home sites.

Vertical Alignment

Alternative Fm roughly follows the existing Fernan Lake Road profile for only the first 1.6 km (1.0 mi) of Segment 1 before taking an upland route, which bypasses many of the sharpest horizontal curves along the existing alignment. This route requires relatively steep grades to reach the plateau before descending relatively steeply prior to Lilypad Bay. The maximum grade experienced in Segment 1 for Alternative Fm is 6.0 and 7.5 percent, respectively, where the alignment leaves and rejoins the current road alignment. The ascending and descending steeper grades of this alternative would require consideration for erosion prevention along the ditch slopes and at their bases during final design. Alternative Fm crosses the Lilypad Bay area north of the existing causeway. To maintain safe road grades, the roadway would be located on a very tall fill slope, roughly 15.2 m (50 ft) high.

The proposed vertical alignment in Segment 2 was developed to best match catchpoints on both sides of the road. The are no substantial differences between Alternatives E and Fm for most of this segment.

Alternative G (Preferred Alternative)

Alternative G would be essentially the same as Alternative E except at Lilypad Bay. Alternative G would construct a curved bridge, approximately 118 m (387 ft) long just north of the existing road. The existing fill, roadway, and the one visible culvert between MP 2.1 and MP 2.2 would be removed and rehabilitated.

No Action Alternative (No Road Reconstruction)

Under the No Action Alternative, any major improvements would be made to the existing roadway. The road would not be reconstructed, the road surface would continue to deteriorate, and load listings would continue. Repairs of road failures would occur on an as-needed basis. Inadequate sight distances and varying pavement widths would not be improved. Additional signs, striping, or guardrails could be provided to enhance safety where right-of-way allows. Bare and eroding slopes along the road would not be stabilized and thus would continue to require ongoing maintenance. Stormwater runoff would continue to flow untreated directly into the lake. Finally, no additional turnouts or parking for recreational visitors would be provided. Accident frequency would climb, as traffic volumes grow, compared to the build alternatives.

2.3 SELECTION OF PREFERRED ALTERNATIVE G

FHWA and the partner agencies evaluated the environmental impacts and the advantages and potential disadvantages of Alternatives E, Fm, and G, as well as the No Action Alternative. The evaluation considered both environmental and other factors. Alternative G was the unanimous choice as the Preferred Alternative. Details on the selection factors and overall ratings for the alternatives are presented first. Then brief summaries are provided for each alternative.

Selection Factors

Table 2-1 provides a visual summarization of the factors that led to the unanimous selection of Alternative G as the Preferred Alternative for the Fernan Lake Road Safety Improvement Project. For each factor, the three build alternatives and the No Action Alternative were discussed in terms of environmental impacts or undesirable features as well as potential opportunities to improve current conditions.

Overall Purpose and Need was an assessment of the alternatives relative to the comprehensive list of project objectives. It looked at the overall performance of the alternatives without focusing on any particular objective. Alternatives E and G were rated highest, and the No Action Alternative was rated lowest. Alternative Fm was given an intermediate rating because ESHD felt it did not meet their agency's purpose and need for the project.

Improved Traffic Safety used results of the IHSDM modeling, which predicted similar reductions in accidents for Alternatives E, Fm, and G when compared to the existing road (No Action). All three build alternatives were given the highest rating because the model predicted they would all have fewer accidents than other preliminary designs using ASSHTO and ITD standards (alternatives not carried forward for analysis, see Section 2.5), which only showed minor accident reduction from the existing road.

Physical Environment considered geology, soils, hydrology, and water quality. All four alternatives were given moderate ratings. The build alternatives would have short-term impacts but offered potential for long-term improvement, especially in water quality.

The converse was true for the No Action Alternative, which would avoid short-term impacts but forego opportunities for long-term improvement.

Table 2-1. Summary of Preferred Alternative Selection

Selection Factor	Alt-E	Alt-Fm	Alt-G	No Action
Overall Purpose and Need	●	◐	●	○
Improved Traffic Safety	●	●	●	○
Physical Environment	◐	◐	◐	◐
Biological Environment	○	◐	●	◐
Human Environment	○	○	◐	●
Improved Road Maintenance	●	◐	●	○
Constructability	●	◐	●	●
New Right-of-Way Required	◐	○	◐	●
Degree of Risk or Uncertainty	○	◐	●	●
Overall Preference	◐	○	●	○

● Least impact and/or greatest opportunity
◐ Moderate impact and/or opportunity
○ Greatest impact and/or least opportunity

Biological Environment considered fish, wildlife, and plant populations and habitats, as well as wetlands. Alternative E was rated lowest because of the in-water construction required to build the bridge across Lilypad Bay and the potential for noise impacts on the nesting bald eagles. Alternative Fm was rated moderate because habitat would be disturbed by construction of the new road alignment between MP 1.0 and MP 2.1. Alternative G rated highest because it would have the least short-term impacts of the three build alternatives while still restoring connectivity in the upper portion of Lilypad Bay, an opportunity for long-term improvement that the No Action Alternative would not provide.

Human Environment considered impacts versus opportunities primarily related to land use, noise, recreation, and visual quality. No Action was rated highest because there would be no short-term construction impacts or long-term changes in visual qualities. Alternatives E and Fm rated lowest. Alternative E would have prolonged noise impacts from driving deep bridge pilings from a barge near the mouth of Lilypad Bay and moderate visual impacts of the new bridge. Alternative Fm would have visual impacts in new places part way up Fernan Hill between MP 1.0 and 2.1, and from the high fill north of Lilypad Bay. Alternative G was the most consistent with existing conditions.

Improved Road Maintenance was rated highest for Alternatives E and G, and lowest for the No Action Alternative. Alternative Fm was given a moderate rating because it would add moderately steep grades for ESHD to maintain. The No Action Alternative would not provide any long-term improvement in road maintenance.

Constructability looked at estimated cost to build relative to available funds, and for conditions or situations that might make construction challenging or prolonged. Although all build alternatives are feasible to construct, Alternative Fm was given a moderate rating because of the extent of cut- and fill-slopes that would be constructed between MP 1.0 and 2.1. Alternative E was rated high for this factor in spite of uncertainty of bridge construction in open water with undefined bottom conditions, because another selection factor specifically considers risk and uncertainty.

New Right-of-Way Required would be greatest, and thus was rated lowest, for Alternative Fm because of the new side-slope alignment for approximately one mile. The No Action Alternative rated highest for this factor because no new ROW would be required. Alternatives E and G were given moderate ratings.

Degree of Risk or Uncertainty looked at potential conditions or situations that could delay or complicate final design and permitting, or that could cause interruptions during construction. By default the No Action Alternative was considered to have the least risk or uncertainty and thus was rated highest for this factor. Alternative G was given a similar rating because it is the build alternative that most closely follows the existing road alignment. Alternative E was rated lowest because the total length of the bridge pilings would not be determined until final design; the bridge location is nearest to the open lake and the bald eagle nest on the south shore; and there is potential to encounter creosote-treated timbers from the original bridge during construction. Alternative Fm was given a moderate rating because there would be new construction on steep slopes and some reconstructed driveway approaches could have steep grades. Also it is not clear at this time whether the easements along the lake between MP 1.0 and MP 2.1 would revert to the respective private landowners or remain with a public agency when the existing road is obliterated.

Overall Preference of Alternatives

Alternative G had either highest or moderate ratings for all factors considered in selecting the preferred alternative. Alternative G was unanimously selected by FHWA and the partner agencies as the preferred alternative for the Fernan Lake Road safety improvement project. This alternative would most closely follow the existing road alignment. Construction of the new curved bridge across Lilypad Bay would occur behind the existing causeway, thus protecting the lake from related short-term impacts to water quality. Alternative G would have fewer visual impacts than the other two build alternatives. All of the improvements in traffic safety, stormwater treatment, roadway maintenance, and parking along the lake that are found in the other build alternatives would be provided by Alternative G.

Alternative E also received many favorable comments in discussions among the partner agencies. Putting a new bridge were the original one was located would shorten the overall route and eliminate three of the curves where accidents (one fatal) have occurred. It also would provide an opportunity to create additional parking near Lilypad Bay. Most disadvantages of Alternative E are related to driving the pilings for the new bridge, such as uncertain depth to bedrock, noisy construction, potential to encounter creosote-treated timbers from the original bridge. Safety concerns related to the public probably fishing from the open water bridge were considered 'a significant issue.'

The No Action Alternative was not considered the preferred alternative. Even though it had similar numbers of high, medium, and low ratings as Alternative E, it clearly failed to meet the purpose and need for the project. Although No Action would avoid impacts of construction, there would be no improvement in safety, road maintenance, and stormwater treatment.

Alternative Fm also was not considered the preferred alternative. This alternative would route traffic over a hill and create new maintenance concerns for ESHD, including winter plowing and maintenance of large cut/full slopes. The preliminary design does not follow natural contours in some places, and thus would result in substantial cut- and fill-slopes to construct the road between MP 1.0 and MP 2.1. The elevation of the proposed road in this area would require a visually conspicuous approximately 15.2 m (50 ft) high fill north of Lilypad Bay, which would also obstruct the lake view from at least one residence. The potential advantages of realigning part of the road away from the lake were not considered adequate to offset the disadvantages of Alternative Fm.

2.4 ACTIVITIES AND FACILITIES COMMON TO ALL BUILD ALTERNATIVES

The following general description of construction activities and impacts applies to all build alternatives and segments unless otherwise noted. Construction would begin with clearing of vegetation along the roadway within the roadway easements. Chainsaws would be used to fell trees, which would be placed in the lake for fish habitat. Hydraulic excavations would be used for removing scrub and stumps. Debris would be rolled, dragged, or otherwise deposited on Fernan Lake Road, where it would be loaded onto dump trucks for removal to a disposal or burn site. The contractor would determine (the location of a disposal site or sites.) The road would be closed at the working location for no more than four-hour periods at a time.

For most of Segment 1 and part of Segment 2 there would be significant cuts into the existing steep slopes along the road corridor to allow for the wider road. Some of the cut material would be used to raise the grade of the road and to create embankments. However, more material would be removed than can be used along the road. The contractor would dispose of the excess cut material.

The method for excavating the slope would depend on whether the slope is made up of loose or crumbly rock or hard, solid rock. A hydraulic excavator would be used to break up and excavate topsoil and crumbly rock. Excavation of solid rock would require drilling and blasting. The blasting would be done along the road in increments of approximately 50 m (164 ft), so that no more debris is generated than can be removed by trucks within four hours. This is typically 300 to 600 m^3 (392.4 to 784.7 cy^3).

Constructing the bridge across Lilypad Bay would create construction impacts in Alternatives E and G that would not occur under Alternative Fm. Construction of the abutment foundations and pilings to support the bridge superstructure would first require cofferdam construction to form an enclosure. Earth would be removed from the enclosure and a de-watering system would be used to remove water from the construction site. The foundation and supports would then be built of concrete. Groundwater removed by the dewatering system from the bridge construction site would be pumped to a temporary detention and treatment pond before release to the lake or infiltration to groundwater. After the bridge (Alternatives E and G) or road (Alternative Fm) is built around the bay, the fill that supports the existing Fernan Lake Road across the bay would be removed. The existing roadway fill would serve as a filter for any accidental sediment release during construction of the new road or bridge (with the exception of Alternative E because its alignment is downstream and lakeward of the existing causeway).

To relocate Fernan Creek in Segment 2 as proposed in Alternatives E, Fm, and G, a new stream channel would be excavated on dry land, leaving a short distance of unexcavated earth at each end. Matting and other stabilization methods would be used to minimize erosion on the new channel banks. When the water is to be diverted to the new channel, the remaining earth between the new and old channel is removed. Plastic sheeting and sandbags are placed over the connection to the previous channel to complete the process of diversion and minimize erosion and turbidity. Excavated material from the road work or channel construction would be used to fill in the old channel.

In Segment 3, the project proposes to follow the existing roadway alignment and rehabilitate its pavement section. In this segment, most of the work consists of driving a specialized piece of equipment called a rotomiller reclaimer over the road surface. The reclaimer chews up the road surface to a pre-determined depth. The resulting mixture of old asphalt and rock is deposited on the road surface behind the reclaimer. This mixture is graded and compacted to create a new subsurface. Depending on the quality of the mixture, additional new asphalt or aggregate may be added to create an optimal consistency. The new subsurface is then paved over. Culverts would either be relined or else would be replaced using a hydraulic excavator. If there were water running through the existing culvert, water would be diverted through a pipe or via a hydraulic pump to a temporary impoundment area.

In terms of construction sequencing, the project would probably begin with the rehabilitation of Segment 3 and move downhill towards Coeur d'Alene.

2.5 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM CONSIDERATION

Ten alternative routes that avoid part (Routes 1, 2, and 3) or all of the current Fernan Lake Road were evaluated, but none were considered practical or prudent. Four of the seven preliminary designs that use the existing road alignment were not carried forward for analysis in this EIS. Two early designs would have required extensive lake encroachment and other impacts considered unacceptable. Two subsequent narrower designs showed less than a 23 percent reduction from the current road in collisions predicted by IHSDM.

Alternative Routes

Figure 2-2 is a map showing the ten alternative routes, some of which have sections in common. The map also differentiates existing paved roads from gravel roads from relatively narrow driveways and lanes or where an entirely new road would need to be developed.

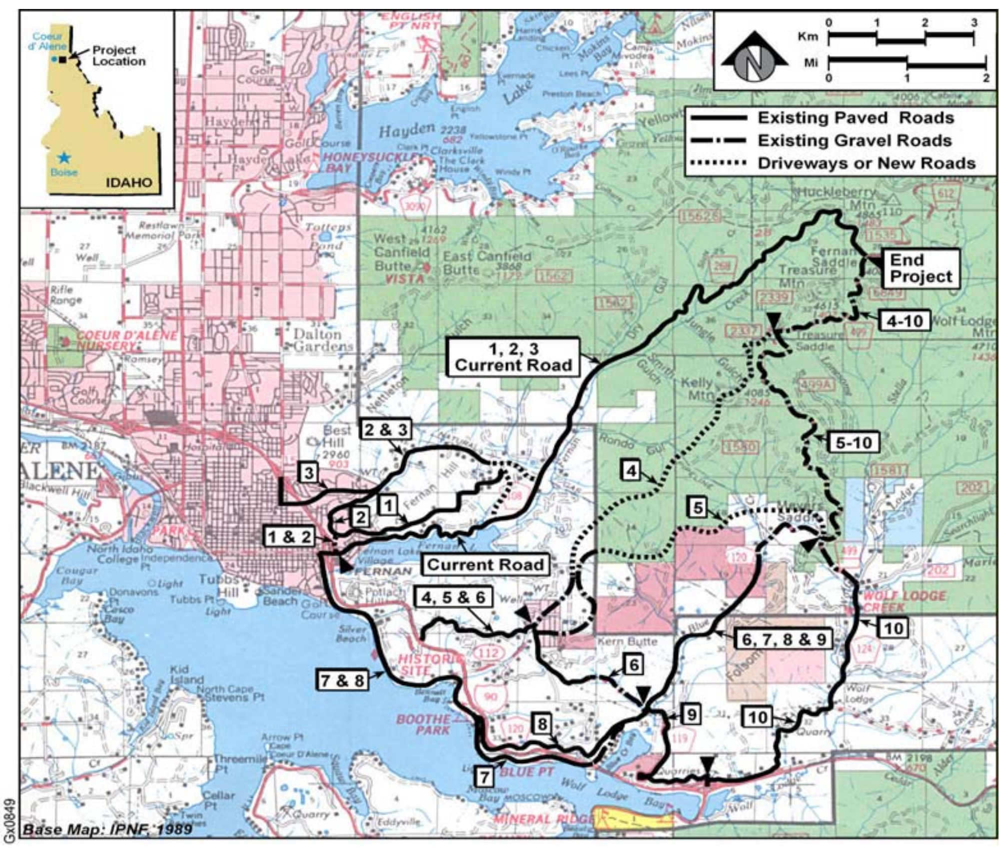

Figure 2-3. Alternative Routes Considered but Eliminated

Table 2-2 is a visual summarization of screening the ten alternative routes for each of the twelve project objectives. Similar ratings are provided for the Fernan Lake Road Corridor as a comparison. Additional details on results for each screening criterion and route are presented in Appendix B. Chapter 5 also discusses these routes in the context of Section 4(f) requirements.

Table 2-2. Summary of Screening Alternative Routes and Fernan Lake Road Corridor

	FLR	Alt-1	Alt-2	Alt-3	Alt-4	Alt-5	Alt-6	Alt-7	Alt-8	Alt-9	Alt-10
Transportation Objectives											
1. Access to IPNF from CDA	●	◑	●	●	◑	◑	◑	◑	◑	◑	◑
2. Improve Traffic Safety on FLR	●	○	○	○	○	○	○	○	○	○	○
3. Serve Projected Needs	●	◑	◑	◑	◑	◑	◑	◑	◑	◑	◑
Maintenance Objectives											
4. Reduce Maintenance Costs	●	○	○	○	○	○	○	○	○	○	○
5. Correct Existing Deficiencies	●	○	○	○	○	○	○	○	○	○	○
Environmental Objectives											
6. Reduce Sideslope Erosion	●	○	○	○	○	○	○	○	○	○	○
7. Minimize Impacts to Sensitive Species and Cultural Resources	◑	◑	◑	◑	◑	◑	◑	◑	◑	◑	◑
8. Protect Roadside Environment	●	○	○	○	○	○	○	○	○	○	○
9. Improve Runoff Water Quality	●	◑	◑	◑	○	○	○	○	○	○	○
Land Use and Planning Objectives											
10. Provide Safe Recreational Parking	●	○	○	○	○	○	○	○	○	○	○
11. Minimize New Private ROW	◑	○	○	○	◑	◑	◑	◑	◑	◑	◑
12. Be Consistent with Applicable Plans	●	◑	◑	◑	◑	◑	◑	◑	◑	◑	◑
Overall Screening	●	◑	◑	◑	○	○	○	○	○	○	○

● Meets or substantially meets objective

◑ Partially meets the objective

○ Does not or only slightly meets objective

Notes:

1. Fernan Lake Road (FLR) corridor includes Segments 1, 2, and 3 of the existing road.
2. The full wording of the objectives is provided in Section 1.3.

Route 1

This route would provide access to I-90 at Sherman Avenue. Just east of the interchange the route would follow Lilac Lane north, then require a new road approximately 0.2 km (0.1 mi) be constructed up the west end of Fernan Hill to connect with Fernan Hill Road. A new road approximately 1.4 km (0.9 mi) long would be needed from the eastern end of Fernan Hill Road, down the hill and along a driveway, to Fernan Lake Road at the east edge of Lilypad Bay. This route would then follow the existing road through Segments 2 and 3 to Fernan Saddle.

Route 1 is 1.9 km (1.2 mi) longer to Fernan Saddle than the current road and avoids most of Segment 1 where the majority of accidents have occurred. Safety would remain a concern because it has steep grades, especially at the new connection between Lilac Lane and Fernan Hill Road, it introduces logging trucks and recreational vehicles to residential neighborhoods, and school buses currently use the route. Existing maintenance requirements, parking problems, and stormwater treatment deficiencies in Segment 1, most of which would need to remain in service, would not be corrected if Route 1 were built. New ROW requirements would likely impact four houses on Lilac Lane and ten houses and two garages on Fernan Hill Road.

Alternative Route 1 is feasible, but not practical or prudent. Of special concern is the introduction of large commercial vehicles and long recreational vehicles to a residential neighborhood on a route used by school buses. The City of Coeur d'Alene has opposed this route for these reasons. Thus the SEE team eliminated Route 1 from further consideration.

Route 2

Alternative Route 2 also connects with I-90 at Sherman Avenue, goes north on Lilac Lane, and then requires a new road up the west end of Fernan Hill. This route then continues north to French Gulch Road, which it follows to Stacel Draw. Approximately 1.8 km (1.1 mi) of new road would between the east part of French Gulch Road and Fernan Lake Road at approximately MP 3.2. The route then would follow the remainder of Segment 2 and 3 to Fernan Saddle.

This route is only slightly longer (0.4 km, 0.3 mi) between I-90 and Fernan Saddle than the current road. As is the case with Alternative Route 1, many of the potential safety benefits of directing traffic away from Segment 1 are offset by new concerns of Route 2 introducing logging trucks and recreational vehicles into residential neighborhoods where school buses run. All of the current problems and deficiencies in Segment 1 would remain uncorrected, as would those in the first 1.6 km (1.0 mi) of Segment 2. Four houses on Lilac Road and one on the connection to French Gulch Road would be required for ROW.

Alternative Route 2 is feasible, but neither practical nor prudent, for many of the same reasons listed for Route 1. The City of Coeur d'Alene has also opposed this route. Thus the SEE team eliminated Route 2 from further consideration.

Route 3

Route 3 would connect with I-90 at the 15th Street interchange, then proceed south on 15th Street, east on East Elm Avenue, northeast on Stanley Hill Road, and east on East Harrison Avenue to French Gulch Road. It would then be the same as Route 2 to Stacel Draw and Fernan Lake Road to Fernan Saddle.

This route is 0.9 km (0.6 mi) longer than the existing road from I-90 to the saddle. Of all the alternative routes, this one makes the most use of city streets and residential neighbor hoods. Requirements for new ROW would affect two apartments, three businesses, a church, and a golf club. The City of Coeur d'Alene has stated opposition to this route. Alternative Route 3 was eliminated from further consideration by the SEE team for the same reasons that Routes 1 and 2 were eliminated.

Route 4

This route would connect with I-90 at the Mullan Trail Road interchange and proceed east on Mullan Trail Road for approximately 2.6 km (1.6 mi). It would then go northeast for 10.0 km (6.2 mi) to Treasure Saddle, first on gravel roads, but mostly on a new road. The route would then follow FS Road (FR) 499 to Fernan Saddle. Fernan Lake Road is not used at all.

This alternative is the shortest route between I-90 and Fernan Saddle (15.8 km, 9.8 mi), but the total distance from Coeur d'Alene (Sherman Ave exit) is greater than the existing route by 0.9 km (0.6 mi). Route 4 would require the most new road construction, much of it in steep terrain and at relatively high elevations near the Fernan watershed boundary. The new road would cross undisturbed woodlands and elk wintering ground, and its ridgeline location would affect two watersheds instead of one. Most of the route is on IPNF, but new ROW requirements could affect two wells, a water tank, and ESHD buildings.

None of the existing deficiencies and problems of Fernan Lake Road would be corrected if Route 4 were constructed. ESHD would need to maintain both the existing road and the new route. Because the route tends to follow the ridgeline, much of it would be snow-covered and difficult to keep open in winter. Constructing approximately 8.3 km (5.0 mi) of new road in difficult terrain would cause total costs to far exceed the current budget for the project.

The SEE team eliminated Alternative Route 4 from further consideration because it would cost much more than the available budget to build; it would be difficult to keep open year round, and would not correct any of the problems and deficiencies of the current road, thereby failing to meet the purpose and need for the project. Thus although feasible to build, this route was not considered practical or prudent.

Route 5

Route 5 would also start at the Mullan Trail Road interchange on I-90 and follow the same roads as Route 4 for the first 2.6 km (1.6 mi). It would then leave known roads in the vicinity of Captain John Mullan Road and require approximately 7.5 km (4.5 mi) of new road along another ridgeline running north and east to Meyer’s Saddle. This route would then follow FR 499 for 10.0 km (6.2 mi) to Treasure Saddle and Fernan Saddle.

This route to Fernan Saddle is 22.2 km (13.8 mi) from I-90 and 25.3 km (15.7 mi) from Coeur d’Alene at Sherman Avenue. It would have steep grades and sharp curves, with the switchback at Meyer’s Saddle being very difficult to correct. Much of the route would be at high elevations that would be snow-covered and difficult to keep open in winter. Many travelers to Fernan Saddle would probably continue to use Fernan Lake Road rather than this longer route. As was the case with Route 4, construction costs for new road would increase total costs far beyond the current budget for this project.

Alternative Route 5 is feasible, but not practical or prudent. It was eliminated from further consideration by the SEE team for the same reasons that Route 4 was eliminated.

Route 6

This route is the same as Routes 4 and 5 for the first 2.6 km (1.6 mi). Then it follows Sunnyside Road southeastward for 3.7 km (2.3 mi) to Blue Creek Road, which it follows northeastward for 6.4 km (4.0 mi) to Meyer’s Saddle. The last 10 km (6.2 mi) is on FR 499 to Treasure Saddle and Fernan Saddle.

The distance on Route 6 to Fernan Saddle is 22.7 km (14.1 mi) from I-90 and 25.7 km (16.0 mi) from Coeur d’Alene at Sherman Avenue. This alternative has many of the disadvantages of Routes 4 and 5, plus it could affect historic resources in the community of Blue Creek. Although new ridgeline roads would not need to be constructed, the overall length of required improvements would increase total costs well beyond the project budget, while at the same time decreasing the probability that travelers to Fernan Saddle would chose this route over Fernan Lake Road.

The SEE team eliminated Alternative Route 6 from further consideration because it would cost too much to build, it would be difficult to keep open year round, it would probably not attract travelers to Fernan Saddle, and would not correct any of the problems and deficiencies of the current road, thereby failing to meet the purpose and need for the project. Also a purpose of Forest Highway Program is to provide a link between the NFS lands and nearby communities like Coeur d’Alene. Increasing the route by nearly 45 percent would not be consistent with the program. Thus although feasible to build, Route 6 was not considered practical or prudent.

Route 7

Route 7 connects with I-90 at Sherman Avenue, proceeds south along Centennial Trail (also known as Lake Coeur d’Alene Drive) for 6.0 km (3.7 mi), and then crosses under I-90 and continues east along Yellowstone Trail Road for 4.2 km (2.6 mi) to Sunnyside Road and Blue Creek Road. The remaining 16.4 km (10.2 mi) is the same as Route 6.

This route is 27.4 km (17.0 mi) long. In addition to the problems it has in common with Route 6, Route 7 would increase traffic along the Lake Coeur d’Alene shoreline and introduce logging trucks and recreational vehicles towing trailers to the residential neighborhood at Blue Creek Bay. Should travelers to Fernan Saddle chose to use this route, even though it's more than 45 percent longer than the current road, traffic related pollution would be shifted from Fernan Lake to Lake Coeur d'Alene. Requirements for new ROW would possibly impact four old houses and three old barns.

Alternative Route 7 is feasible to build, but it not practical or prudent. The SEE team eliminated this route from further consideration because it would cost too much to build; it would be difficult to keep open year round, it would probably not attract travelers to Fernan Saddle, and would not correct any of the problems and deficiencies of the current road, thereby failing to meet the purpose and need for the project.

Route 8

Route 8 is very similar to Route 7, but continues on Centennial Trail (Coeur d'Alene Lake Drive) for another 4.5 km (2.8 mi) before crossing I-90 and constructing a new connection to Yellowstone Trail Road. New ROW required for construction would impact two home and three barns.

The SEE team eliminated Alternative Route 8 from further consideration for the same reasons Route 7 was eliminated. Although feasible to build, this alternative is neither practical nor prudent.

Route 9

Alternative Route 9 would connect with I-90 at the Wolf Lodge Bay interchange. It would follow Yellowstone Trail Road west and north for 3.7 km (2.3 mi), then connect with Blue Creek Road and follow the same roads as Route 6 to Fernan Saddle.

The distance to Fernan Saddle for Route 9 is 20.1 km (12.5 mi) from I-90 and 31.1 km (19.3 mi) from Coeur d'Alene at Sherman Avenue. Thus travelers to Fernan Saddle from the east on I-90 might use this route, but Fernan Lake Road would continue to be a much shorter route from Coeur d'Alene. High visual impacts would be likely from the rock cliff cut needed to upgrade Yellowstone Trail Road. New ROW needed for construction would impact three old barns.

Route 9 is feasible to construct, but neither practical nor prudent. The SEE team eliminated this route from further consideration because it would cost too much to build; it would be difficult to keep open year round; it would have high visual impacts near I-90; it would probably not attract travelers from Coeur d'Alene to Fernan Saddle, and would not correct any of the problems and deficiencies of the current road, thereby failing to meet the purpose and need for the project.

Route 10

Route also connects with I-90 at the Wolf Lodge Bay interchange, but then follows a frontage road east and Wold Lodge Creek north for 8.9 km (5.5 mi) to Meyer's Saddle. It follows FR 499 north to Treasure Saddle and Fernan Saddle.

The distance for this route to Fernan Saddle is 18.8 km (11.7 mi) from I-90 and 29.8 km (18.5) mi from Coeur d'Alene at Sherman Avenue. As was the case with Route 9, travelers from the east on I-90 may prefer this route to Fernan Saddle, but those from Coeur d'Alene would probably continue to use Fernan Lake Road. This route shares many of the disadvantages of Routes 4 through 9. In addition Road widening is likely to affect Wolf Lodge Creek which contains cutthroat trout. ESHD currently has ROW to the IPNF boundary along this route. New ROW requirements may affect one garage.

The SEE team eliminated Alternative Route 10 from further consideration because it would cost too much to build; it would be difficult to keep open year round; it would probably not attract travelers from Coeur d'Alene to Fernan Saddle, and would not correct any of the problems and deficiencies of the current road, thereby failing to meet the purpose and need for the project. Although this alternative is feasible, it would not be practical or prudent to construct.

Alternative Preliminary Designs

Preliminary designs were completed for Alternatives A, B, C, and D that use the existing route along Fernan Lake Road to Fernan Saddle. All were based on wider design standards for lanes, shoulders, and curve widening than Alternatives E, Fm, and G, which are analyzed in this EIS. To some extent these alternatives represent early stages in the evolution of the alternatives finally selected for analysis. None of these alternatives used IHSDM during preliminary design, although the predicted safety performance of Alternatives B and D was subsequently analyzed with the model.

Alternatives A, B, C, and D were eliminated from detailed analysis in this EIS because IHSDM showed that wider roadways, which would result in greater environmental impacts, failed to improve safety as much as the narrower roadways of Alternatives E, Fm, and G.

Alternative A

Under this alternative the road in Segments 1 and 2 would be reconstructed to a uniform width of 9.6 m (32 ft) using approximately the same alignment as the existing road. This alternative would fully meet ASSHTO standards for width and curve design. The road in Segment 3 would remain at its current width of 7.6 m (25 ft). Existing deficiencies in horizontal and vertical alignments would be reduced or eliminated, and sight distance would be improved to allow a 60 km/h (35 mph) design speed for all of Fernan Lake Road.

This alternative would require substantial work along the lakeshore, including cutting of hillsides and placement of fill into Fernan Lake to provide sufficient width for road pavement and shoulders. Former roadway area along the lake would be available for parking where hillsides would be cut to flatten curve radii. A curved bridge would replace the current fill and roadway across Lilypad Bay.

Alternative A would require acquisition of more ROW through private land than other build alternatives considered, and residences along the lake would be affected. The substantial hillside cuts would be costly and would alter the visual appearance of the north shore until vegetation is re-established. More wetlands would be impacted in Segment 2 and more length of Fernan Creek channel would be altered.

If at all possible, FHWA designs Forest Highway improvements to meet or exceed minimum standards of ASSHTO. The SEE team decided this approach was not practical or prudent for Fernan Lake Road improvements because of the sensitivity of the surrounding environments, the desire to avoid physical impacts to the greatest extent possible, and the desire to minimize taking private property for new ROW requirements. Thus Alternative A was not carried forward for full analysis in the NEPA process.

Alternative B

Alternative B would roughly follow the existing road and widen the roadway approximately evenly on both sides. The road would be reconstructed between MP 0.0 and MP 5.0 to a uniform 8.4 m (28 ft) paved width and rehabilitated at its current width of 7.6 m (25 ft) between MP 5.0 and MP 10.7.

Reconstruction would include excavation of adjacent slopes, placement of fill material, construction of retaining walls, grinding up the existing surface, placement of new base material, new pavement, placement of gravel on the shoulders, relocation of utilities, installation of guardrails, striping, installation of advisory signs, and revegetation of disturbed areas.

In order to gain additional width, reduce the hazard of flooding, and dispose of some of the material generated by cutting into the slopes to permit the road widening, the roadbed would be raised. The grade change would be minor in Segment 1 (less than 0.5 m or 1.5 ft), except at Lilypad Bay where the grade would be raised up to 1.5 m (5 ft) leading up to a bridge to replace the existing fill across the bay.

In Segment 2, in order to raise the road above the predicted 100-year flood elevation, the road elevation would be raised as much as 2 m (6 ft) in places. Construction of the raised roadway would require moving one channel of Fernan Creek that is located immediately adjacent to the roadway in two places, MP 2.8 to MP 3.0 and MP 3.55 to MP 3.9. It appears that the channel has been moved before by landowners wishing to maximize field area. Moving the creek would involve:

- designing and excavating a new channel with appropriate meanders in two places;
- compacting or sealing the channel bottom to keep water in the stream during times of low flows;
- adding cobble and woody debris to the bottom of the stream to provide cover for fish and micro-invertebrates;
- planting appropriate native plants along the banks of the new channel; and

- blocking the old channel and directing stream flows to the new channel.

Alternative B would involve construction of 15 retaining walls in Segment 1 and no retaining walls in Segment 2. Ten of those walls would be located between the roadway and the lake. They would be either gabion or soldier pile fill-side retaining walls. The highest fill-side retaining wall would be 6.5 m (21 ft) and the average height of all fill-side retaining walls is 3.5 m (11 ft). In order to construct these walls, most of the vegetation between the roadway and the lake would have to be removed. As a result, the retaining wall and the new road would be clearly visible from the lake and property across the road on Potlatch Hill.

Alternative B would also involve construction of five cut slope retaining walls. The average height of these walls would be 5.5 m (18 ft) and the maximum height of a retaining wall would be 11.5 m (37 ft). This wall would be at approximately MP 1.2 where the road curves around a point with a home on it. The wall is needed in order to minimize disturbance to this property.

Alternative B includes construction of four pullout/parking areas for visitors along the lake frontage. These would be created in areas where the realignment of the road leaves the existing roadway available for use as a pullout. Directing visitors to park in designated areas should minimize disturbance of other areas and increase the safety for visitors.

In Alternative B a curved bridge located just north of the existing fill would replace the existing fill across Lilypad Bay. The bridge would allow natural hydraulic flows to re-establish in the area. Two streams cross the road in Segment 2, Stacel Draw (MP 3.5) and Dry Gulch (MP 5.0). The culverts that carry these creeks are badly corroded and would be replaced.

Segment 3 (MP 5.0 to MP 10.7) would be rehabilitated under this alternative. The existing road surface would be ground up and a new surface would be laid. The road width (approximately 7.6 m or 25 ft) would remain the same. Rehabilitation would include fixing seven minor slump areas and installation of safety improvements (such as warning signs and striping) in some areas. Culverts would be relined but not replaced, and drainage facilities would not be improved.

Alternative B was eliminated from detailed analysis in this EIS because IHSDM showed that wider roadways, which would result in greater environmental impacts, failed to improve safety as much as the narrower roadways of Alternatives E, Fm, and G.

Alternative C
Reconstruct Segments 1 and 2 to 28 feet Width and Correct Curves; Rehabilitate Segment 3

This alternative is similar to Alternative B. However, to further reduce impacts, this alternative would reduce the roadway width to 8.4 m (28 ft) and include minimal curve correction. AASHTO exceptions would be required for the roadway width and curves.

This alternative would widen and reconstruct the existing roadway between MP 0.0 and MP 5.0 to 8.4 m (28 ft). At specific locations, narrow curves would be engineered to improve safety although curves would not be eliminated. Corroded drainage facilities would be replaced and limited off-road parking would be provided. Between MP 5.0 and Fernan Saddle (MP 10.7), the road surface would be rehabilitated at its current width of 7.6 m (25 ft).

Alternative C would provide certain safety benefits by resolving some of the existing safety problems associated with tight curves, narrow pavement, inadequate sight distance, and deteriorating pavement conditions. Maintenance operations would be reduced. This alternative would require acquisition of some ROW through private property, though not as much as Alternatives A or B, because the correction of substandard horizontal and vertical alignment would be limited. The hillside cuts would be costly and would alter the appearance of the north side of the lake until vegetation is re-established. Placement of fill in Fernan Lake would be required with potentially adverse effects on fish.

Alternative C was eliminated from detailed analysis in this EIS because IHSDM showed that wider roadways, which would result in greater environmental impacts, failed to improve safety as much as the narrower roadways of Alternatives E, Fm, and G.

Alternative D
Realignment in Part of Segment 1

Alternative D would roughly follow the existing road for the first 1.9 km (1.1 mi) and then realign the road to the north, away from Fernan Lake, rejoining the existing alignment northeast of Lilypad Bay (MP 2.2). The realignment would avoid three very narrow curves at approximately MP 1.2, MP 1.4 and MP 1.7.

This alternative would widen the roadway primarily to the north along Segment 1 to avoid disturbing vegetation along the lake. Protecting the existing lakeside vegetation would help to minimize the visual impacts of the road improvements from the lake and homes on Potlatch Hill. The vegetation also functions to trap sediment and cleanse run-off from the road.

The road would be reconstructed between MP 0.0 and MP 5.0 to a uniform 8.4 m (28 ft) paved width and rehabilitated at its current width of 7.6 m (25 ft) between MP 5.0 and MP 10.7.

Reconstruction would include excavation of adjacent slopes, placement of fill material, construction of retaining walls, grinding up the existing surface, placement of new base material, new pavement, placement of gravel on the shoulders, relocation of utilities, installation of guardrails, striping, installation of advisory signs, and revegetation of disturbed areas.

Because Alternative D would avoid disturbance between the existing road and the lake and would realign the road away from the lake for half of Segment 1, this alternative would involve construction of fewer retaining walls. A total of seven retaining walls would be needed, six in Segment 1 and one in Segment 2. Only two of the walls in Segment 1 would be located between the roadway and the lake. They would be either gabion or soldier pile fill side retaining walls. The highest fill-side retaining wall would be 1.0 m (3.2 ft) and the average height of all fill-side retaining walls is 0.5 m (1.6 ft).

Alternative D would also involve construction of five cut slope retaining walls in Segment 1. The average height of these walls would be 5 m (16 ft) and the maximum height of a retaining wall would be 15 m (48 ft). This wall would be along the west shore of Lilypad Bay, to support the realigned road as it came down to join the existing road. The wall is needed in order to minimize disturbance to adjacent property. This wall would not be visible from most of Fernan Lake.

Alternative D includes construction of two pullout/parking areas for visitors, one along the lake frontage at MP 0.4 and one adjacent to the Fernan Boat Launch (MP 2.2). Pullouts would be created in areas where the realignment of the road leaves the existing roadway available for use as a pullout. By directing visitors to park in designated areas, the FS and ESHD hope to minimize disturbance of other areas and increase the safety for visitors.

The existing roadway easement between MP 1.1 and MP 2.0 would probably revert to the property owner, unless the FS, ESHD or another public agency purchased a portion of the roadway for public use. If the easement reverted to the property owner, then the Fernan Fishing Dock would have to be relocated, and public access to the lake frontage between MP 1.1 and MP 2.0 would be eliminated.

In Alternative D the realigned road would not cross Lilypad Bay, but would cross the two unnamed streams that feed into the bay from the north. The existing fill would be removed and the streams would cross under the road in culverts. Removal of the fill would allow natural hydraulic flows to re-establish in the area.

Two streams cross the road in Segment 2, Stacel Draw (MP 3.5) and Dry Gulch (MP 5.0). The culverts that carry these creeks are badly corroded and would be replaced under Alternative D as under Alternative B.

Segment 3 (MP 5.0 to MP 10.7) would also be rehabilitated under Alternative D. That is, the existing road surface would be ground up and a new surface would be laid. The road width (approximately 7.6 m or 25 ft) would remain the same. Rehabilitation would include fixing seven minor slump areas and installation of safety improvements (such as guardrail) in some areas. No culverts would be replaced and drainage facilities would not be improved.

Alternative D was eliminated from detailed analysis in this EIS because IHSDM showed that wider roadways, which would result in greater environmental impacts, failed to improve safety as much as the narrower roadways of Alternatives E, Fm, and G.

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3.0 AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES, AND MITIGATION

This chapter describes the affected environment, and the direct, indirect, and cumulative effects that would be expected to occur as a result of implementing each of the alternatives described in Chapter 2. The resources associated with the significant issues identified in Chapter 2 are discussed first, followed by other resources. In each resource section, the affected environment is discussed initially. In some cases, the regulatory setting is described first, followed by the affected environment section. Impacts are discussed by alternative, including the No Action Alternative. In the effects section, potential direct, indirect, and cumulative effects are described. Resource commitments and proposed mitigation are discussed for each resource. In most cases, proposed mitigation would apply to all build alternatives; exceptions are discussed in the respective mitigation sections.

Terms Used in this Chapter

Short-term and Long-term Effects

In the section about effects for each resource, effects are described as either short term or long term. Short-term impacts for this project would persist 5 years after the initiation of revegetation, and primarily would result from temporary construction disturbances that either would be reclaimed, such as cut-and-fill slopes, or would cease, such as construction noise. Short-term impacts of the proposed project would last until 2014 assuming the completion of the final construction phase is 2009. Long-term impacts would last more than 5 years after construction. Some long-term impacts would be very long, such as effects on old growth forest, and others would be permanent, such as the visual effects of a wider road.

Direct, Indirect and Cumulative Effects

Direct impacts are those that would be the direct result of implementing one of the alternatives. Most direct effects from reconstruction would occur from creating cut slopes and placing fill, pavement, or other structures. Indirect impacts (also called secondary impacts) are those that are project-induced but occur later in time or are farther removed in distance. Dispersed recreation, such as hiking or backpacking, may increase because a reconstructed road would provide easier access and more people would use the area. Such an increase would be an indirect effect. A cumulative effect is defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR 1508.7).

Irreversible or Irretrievable Commitment of Resources

NEPA requires a discussion of any irreversible or irretrievable commitment of resources that would result from implementing the alternatives. An irreversible commitment of resources means nonrenewable resources that are consumed or destroyed. These resources are permanently lost due to project implementation. For the proposed project, fossil fuel resources used during construction would represent an irreversible commitment of resources because their use is lost for future generations.

In contrast to an irreversible commitment of resources, an irretrievable commitment of resources is the loss of resources or resource production, or use of renewable resources during road construction and during the period of time that the road is in place. Irretrievable commitments are not permanent; they are limited to a specific time frame. For the reconstruction of Segment 2, the time frame for irretrievable resource commitments is the period of time that the road remains in place. For example, areas of existing wetland communities would be filled and the areas would be covered by pavement during reconstruction. This would represent an irretrievable loss of resources and production while the road is in place. If the road is removed at some point in the future, it is possible for the wetland communities to grow (produce) again. Wetland communities disturbed during construction but not covered by an impermeable surface also represents an irretrievable loss of resources. In this case, the period of time between disturbance and complete revegetation represents an irretrievable loss of resources.

Available Engineering and Environmental Study Reports

The FHWA completed numerous engineering and environmental studies for the proposed project. These studies are documented in technical reports, and are available from FHWA. Some of the information in the technical reports may differ from that presented in this EIS where the proposed project information, design, or analysis have been updated. The following technical reports are available:

DEA (David Evans and Associates, Inc.) 2000. *Project Checklist, Fernan Lake Road Safety Improvement Project.*

________. 2003. *Biological Resources Report, Fernan Lake Road Safety Improvement Project.*

________. 2003. *Hydraulics Report, Fernan Lake Road Safety Improvement Project.*

________. 2003. *Land Use Report, Fernan Lake Road Safety Improvement Project.*

________. 2003. *Recreation Report, Fernan Lake Road Safety Improvement Project.*

________. 2004. *Right-of-Way and Utilities Report, Fernan Lake Road Safety Improvement Project.*

________. 2003. *Socio-economic Report, Fernan Lake Road Safety Improvement Project.*

________. 2003. *Traffic Report, Fernan Lake Road Safety Improvement Project.*

________. 2003. *Visual Report, Fernan Lake Road Safety Improvement Project.*

________. 2003. *Water Quality Report, Fernan Lake Road Safety Improvement Project.*

________. 2003. *Wetlands Report, Fernan Lake Road Safety Improvement Project.*

ET (Earth Tech, Inc.). 2002. *Road Safety Risk Assessment, Fernan Lake Road Safety Improvement Project.*

________. 2003. *Alternative E: Final Report, Fernan Lake Road Safety Improvement Project.*

________. 2003. *Alternative Fm: Final Report, Fernan Lake Road Safety Improvement Project.*

________. 2003. *Alternative G: Final Report, Fernan Lake Road Safety Improvement Project.*

FHWA (Federal Highways Administration). 1996. *Idaho Forest Highway 1 (Fernan Lake Road) Geotechnical Reconnaissance*.

________. 1997. *Preliminary Floodplain Analysis, Fernan Lake Road Safety Improvement Project.*

________. 1996. *Project Identification Report, Fernan Lake Road.*

GRI (GRI Geotechnical and Environmental Consultants, Inc.). 2003. *Hazardous Materials Report, Fernan Lake Road Safety Improvement Project.*

NTL (NTL Engineering and Science, Inc.). 2001. *Location Design Phase Geotechnical Investigations Report, Fernan Lake Road.*

________. 2002. *Preliminary Design Phase Geotechnical Investigation Report, Fernan Lake Road*.

NWAA (Northwest Archeological Associates, Inc.). 2003. *Cultural Resources Report, Fernan Lake Road Safety Improvement Project.*

TW (TW Environmental). 2003. *Air Quality Report, Fernan Lake Road Safety Improvement Project.*

________. 2003. *Noise Report, Fernan Lake Road Safety Improvement Project.*

3.1 TRANSPORTATION

Fernan Lake Road is classified as a Rural Major Collector by the American Association of State Highway and Transportation Officials (AASHTO, 2001) and Kootenai County Area Transportation Plan (KCATP) (Kootenai County, 1998). This classification is consistent with ITD standards. Rural collector routes carry traffic that is primarily of intracounty rather than statewide importance. Major collector roads serve traffic generators such as schools, county parks, and mining or agricultural areas, link these places with nearby towns or cities, and connect rural areas to more important intracounty travel corridors.

Posted speed limits on the road are 40 km/h (25 mph) in Segment 1 and 60 km/h (35 mph) in Segment 2. The speed limit is not posted in Segment 3.

Parking along the roadway is generally allowed as long as vehicles do not extend into the traffic way. However, there are sections of roadway that have signs indicating no parking is permitted. In some parts of the roadway, shoulders are wide enough to safely accommodate parked vehicles, but in other sections, shoulders are narrow and parked vehicles can compromise safety. Parked vehicles extending into the roadway can force passing vehicles into opposing traffic lanes and partially obscure sight distances, further decreasing safety. Roadside parking demand is greatest in Segment 1 along Fernan Lake where curving characteristics and narrow shoulders limit the number of areas where vehicles can safely and legally park.

Traffic

Traffic Volumes

In July 2001, ITD conducted weekday traffic counts on Fernan Lake Road that included total volume, commercial vehicle volume, and travel speed. Traffic data on all three segments was collected on a variety of days and times of year. Daily traffic volumes fluctuate for a variety of reasons. Weekend and weekday traffic may have different traffic characteristics including volume, composition of traffic, and purpose of trip. This is true from month to month as well. Summer traffic characteristics differ from winter traffic characteristics.

Other counts for Segment 1 were taken over four years on weekdays and weekends. Results for May and July are similar, with average volumes of 850 vehicles per day. The November 1999 count was made on a weekend, and although slightly higher than the May and July 2001 counts, it is in line with those results. It is reasonable to expect that the average daily weekend volume in 1999 would be greater than the 2001 average daily weeklong volume because of the increased number of people taking advantage of the available recreational activities in the Fernan Creek valley and adjacent forests. In addition, the timing of the counts likely coincided with the fall hunting season. The count collected at MP 0.8 is approximately 25 percent lower than the other counts along Segment 1 and may reflect factors ranging from time of year (December) to year of the count (1998).

In Segment 2, July counts were approximately 18 percent higher than during May. November 1999 volumes were approximately 30 percent higher than July 2001 volumes and 55 percent higher than May 2001 volumes.

IPNF has been collecting traffic data every year for 20 years in Segment 3. Data collection periods have ranged from 126 to 221 days. Volumes have been fairly consistent over the past five (5) years, averaging about 235 vehicles per day. Counts collected in July 2001 were about 50 percent higher than average counts that were typically collected over six-month periods. Higher July volumes are most likely a result of summer recreational activities.

Seasonal Fluctuations

Although Fernan Lake Road is used by recreational traffic throughout the year, traffic volumes vary month to month. Summer months typically see high volumes with more recreational usage during both weekdays and weekends. October is also a high volume month coinciding with hunting season. Winter months typically see lower volumes with most recreational activity occurring on weekends. Data supporting the seasonal fluctuations are presented below. Segments here are discussed in reverse order.

Segment 3

IPNF not only counts volumes continuously over a collection period, but also takes readings during the period, enabling seasonal fluctuations and peak periods to be identified. An examination of the monthly data reveals a seasonal distribution pattern. The pattern indicates that July typically has the highest volumes, averaging approximately 152 percent of annual average daily traffic (AADT). October is typically the second highest month with volumes approximately 151 percent of AADT, roughly equivalent to July’s volumes. Lowest volume months occur from December through April, with volumes 40 to 45 percent of AADT. These seasonal patterns reflect an average of historical patterns. However, it should be noted that there is significantly less data gathered for the months of November through March than were collected for other months of the year. Therefore it is not possible to reach definitive conclusions with respect to traffic distribution patterns for late fall, winter, and spring months. In addition, for any given year the pattern may differ for a variety of reasons, such as weather.

Segment 2

Segment 2 traffic is primarily comprised of residential and pass-through traffic. Seasonal fluctuation patterns are not directly applicable to residential traffic in Segment 2. Based on an estimated ten trips per household per day (ITE, 1997), the six homes in Segment 2 would conservatively generate approximately 15 percent of Segment 2 AADT. These residential volumes would be expected to be fairly steady throughout a year and not subject to seasonal fluctuations. The residential pattern was assumed to have no monthly fluctuation as most residential trips (work, shopping, etc.) are regular and non-discretionary. Even weekend patterns have been shown to be fairly consistent over a year.

The seasonal pattern in Segment 2 was assumed to be similar to the pattern developed for Segment 3 because there are no recreational facilities in Segment 2 and non-residential traffic would be made up of vehicles traveling to Segment 3 and the IPNF. Seasonal fluctuations affect non-residential traffic only, which is approximately 85 percent (100 percent total - 15 percent residential) of traffic volume at the beginning of Segment 2. The combined monthly pattern for Segment 2 was estimated using a weighted average of seasonal and residential traffic.

Segment 1

Segment 1 is similar to Segment 2 in having residential traffic as well as seasonal, recreational traffic. Continuing to estimate ten trips per household per day (ITE, 1997), 23 homes in both Segments 1 and 2 (comprised of 17 homes in Segment 1 and 6 homes in Segment 2), would generate approximately 25 percent of daily traffic as measured at the beginning of Segment 1.

The seasonal pattern was assumed to be similar to the pattern developed for Segment 3, affecting approximately 75 percent of volume at the end of Segment 1 and beginning of Segment 2. The residential pattern was assumed to have no monthly fluctuation, and the combined pattern was estimated using a weighted average of seasonal and residential traffic.

Vehicle Classification Data

The only available vehicle classification data for Fernan Lake Road was collected on a weekday in July 2001. Classifications were based on axle spacing and volume counts. Passenger vehicles without trailers accounted for 92.5 to 93.8 percent of traffic on all segments of the road. The remaining 6.2 to 7.5 percent of traffic was made up of passenger vehicles with trailers, two- or three-axle trucks, semi-trailers and recreational vehicles. Counts were collected on a weekday when recreational vehicles and vehicles towing boats, campers, and snowmobiles may have been less prevalent than during weekends. Conversely, delivery truck and other commercial traffic may have been slightly higher than would be expected on weekend levels.

Peak Hour Volumes

The July 2001 counts are the only counts with hourly volume information. Peak hour volumes ranged from 8.6 percent of total daily traffic in Segment 1 to 11.3 percent in Segment 3. These percentages fall within the typical range of 8 to 12 percent found on most roadways.

The hourly volume that a roadway is designed to accommodate is known as the design hourly volume (DHV). The DHV for rural highways is typically the 30th highest traffic hour (out of 8760 hours) expected to occur in some future year. AASHTO typically prescribes a DHV value of 15 percent of AADT for rural highways (AASHTO, 2001). However, the process of using the DHV should be used cautiously on rural recreational routes where there may be substantial volume variations among the highest hours of the year (FTE, 2001).

Baseline Volumes

Baseline traffic volumes for 2001 were developed by combining traffic counts, seasonal fluctuations, vehicle classifications, and peak hour data. Results are shown in Table 3-1.

Baseline volumes were calculated by estimating AADT volumes from 2001 counts using seasonal adjustment factors and then calculating a weighted average for the AADT estimates.

Table 3-1. Baseline (2001) Traffic Volumes

			AADT		Peak seasonal volume		
Date	Measured volume	Seasonal adjustment factor	Total volume	Commercial volume	Total volume	Commercial volume	Design-hour volume
Segment 1							
23 Jul 01 – 24 Jul 01	844	139%	605				
24 Jul 01 – 25 Jul 01	858	139%	615				
3 May 01 – 10 May 01	839	97%	865				
Weighted average			810	31 (3.8%)	1,125	43 (3.8%)	120
Segment 2							
23 Jul 01 – 24 Jul 01	513	144%	355				
24 Jul 01 – 25 Jul 01	523	144%	365				
3 May 01 – 10 May 01	439	97%	450				
Weighted average			430	21 (4.8%)	610	29 (4.8%)	65
Segment 3							
24 Jul 01 – 25 Jul 01	355	152%	235				
12 Jul 01 – 3 Dec 01	227	130%	175				
Weighted average			175	6 (3.5%)	265	9 (3.5%)	25

Note: Calculations are described in the Traffic Report (DEA, 2003).

Projected Traffic

Historic and peak-hour traffic volumes to project future traffic conditions were examined. Although data for Segments 1 and 2 are limited to the years 1998-2001, FS counts are available for Segment 3 for the years 1982-2001. ADT volume growth in Segment 3 has varied from year to year with increases of as much as 55 vehicles in one year (1995 to 1996) and decreases of as much as 39 vehicles in one year (1988–1989). On average over the 20-year period, volumes on Segment 3 have grown by two vehicles per year or about one percent per year. This calculation is the same whether comparing 2001 counts with 1982 counts and averaging growth or performing a regression analysis of all data for the 20-year period.

This growth rate may not be applicable as a predictor of future growth on the entire project for several reasons. First, it applies only to the FS section of the roadway and does not reflect recreational activity along the lake or use of the Fernan Rod & Gun Club facility. Secondly, some roadways into the IPNF were closed in 2001 (IPNF, 2001) which may result in increased traffic on Fernan Lake Road including Segment 3. Finally, it is not consistent with the growth rate used in the KCATP. The KCATP assumed a countywide population growth forecast of 2.5 percent per year, which is considerably higher than the historic traffic growth rate for Segment 3. For these reasons, population growth trends are assumed to be a better indicator of future growth on the entire Fernan Lake Road project corridor than traffic data for Segment 3 alone.

The KCATP adopted in 1998 estimated year 2017 AADT volumes for much of the county. However, AADT projections were not made for Fernan Lake Road. An average annual growth rate of 2.5 percent was used to forecast population, employment, and land use for the county. Therefore, the 2.5 percent average annual growth rate from the KCATP was used in calculations to estimate future AADT.

Table 3-2 summarizes total traffic and commercial vehicle forecasts based on the KCATP's 2.5 percent population growth forecasts. AADT, peak season, and design-hour traffic volumes are also projected based on the aforementioned assumptions.

Table 3-2. Year 2026 Estimated Traffic Volumes

	AADT[1]		Peak season[2]		Design-hour[3]
Location	Total	Commercial	Total	Commercial	Total
Segment 1	1,500	57 (3.8%)	2,085	79 (3.8%)	225
Segment 2	795	38 (4.8%)	1,145	55 (4.8%)	120
Segment 3	325	11 (3.5%)	495	17 (3.5%)	50

[1]AADT volumes are estimated based on an average annual growth rate of 2.5% per year.
[2]Peak season traffic volumes represent average July traffic conditions. Seasonal factors are assumed to be 139% on Segment 1, 144% on Segment 2, and 152% on Segment 3.
[3]The DHV is assumed to be 15% of ADT, in accordance with AASHTO guidelines.

Safety

Travel Speeds

In 2001, ITD collected travel speeds (average and 85th percentile) for both directions in all three segments. Posted speed limits are 40 km/h (25 mph) from MP 0.0 to MP 2.2 and 60 km/h (35 mph) from MP 2.2 to MP 5.0. No speed limit is posted beyond MP 5.0. Average speeds were higher than and typically within 8 km/h (5 mph) of posted speed limits. Speeds were typically higher westbound than eastbound. One explanation for the difference could be that a proportion of eastbound drivers in Segment 1 were recreational users looking for parking along the roadway. The distinct downhill grade in Segment 3, and the more moderate one in Segment 2, would explain faster westbound speeds in these segments.

The 85th percentile speed reflects the speed compared to which 15 percent of drivers are traveling more quickly and 85 percent are traveling at the same speed or more slowly. In speed studies, the 85th percentile speed is generally used to set the posted speed limit unless geometric factors dictate a slower speed. The 85th percentile speeds on Fernan Lake Road were 6 to 11 km/h (4 to 7 mph) higher than average travel speeds.

Accident History

Background Data

Data from the ITD crash database[1] were obtained to evaluate rates of crashes and identify locations where crashes frequently occur. The database contained records for 33 crashes that occurred during the ten-year period of 1992 through 2001. The number of reported crashes by year ranged from zero in 1992 to eleven in 2001.

There have been two fatalities on the road, both in 1997. One occurred at MP 1.2 on a straight section of roadway at about 6 a.m. It was a clear, dry day and the cause of the crash is unknown. The second fatal crash occurred at MP 2.1 on a horizontal curve. Conditions were dark and rainy, and the primary cause of the crash was determined to be “exceeding the posted speed.” A secondary cause was also noted: “too fast for conditions.”

Eleven crashes involved injuries and twenty reported crashes along Fernan Lake Road resulted in property damage only. Crash reports indicate the type of crash and the general location of damage but do not provide an estimate of the cost associated with damage.

Crashes that involve property damage only may not be reported to the sheriff and may be undercounted in the database. According to local sources such as ESHD and IPNF, there have been unreported crashes occurring on Fernan Lake Road during the ten-year period. Unreported crashes typically involve minor damage to vehicles (scrapes, scratches, and dents) and rarely involve injuries.

Crash Locations

More than half the crashes on Fernan Lake Road occurred on sharp curves in the eastern half of Segment 1 (Figure 3-1). Most crashes occurred because drivers were exceeding speed limits and/or traveling too fast for roadway conditions. Where sharp curves were involved, it appears drivers did not heed advisory speed signage and were unable to negotiate curves at traveling speeds. Six locations had two or more crashes, and circumstances for crashes at these locations were similar. Almost all multiple crash locations had sharp curves and were along the lake.

Historical Crash Rates for Segment 1

The average crash, injury, and fatality rates for Segment 1 are significantly higher than statewide averages for the six-year analysis period. The average crash rate (5.32 crashes per million vehicle miles [mvm] of travel) is 3.3 times the statewide average. The average injury rate (1.47/mvm) is 2.3 times the statewide average. The average fatality rate (0.50/mvm) is 25 times the statewide average.

ITD’s Office of Highway Safety calculates crash rates by highway volumes. For state highways with volumes between 601 and 1,600 vehicles per day, the crash rate for the year 2000 is 1.12/mvm. The year 2000 crash rate for Segment 1 is approximately 3.7 times this average, and the six-year average crash rate for Segment 1 is nearly 5 times this average.

[1] The crash database is a compilation of the Idaho Vehicle Collision Reports prepared by the officers responding to the crashes.

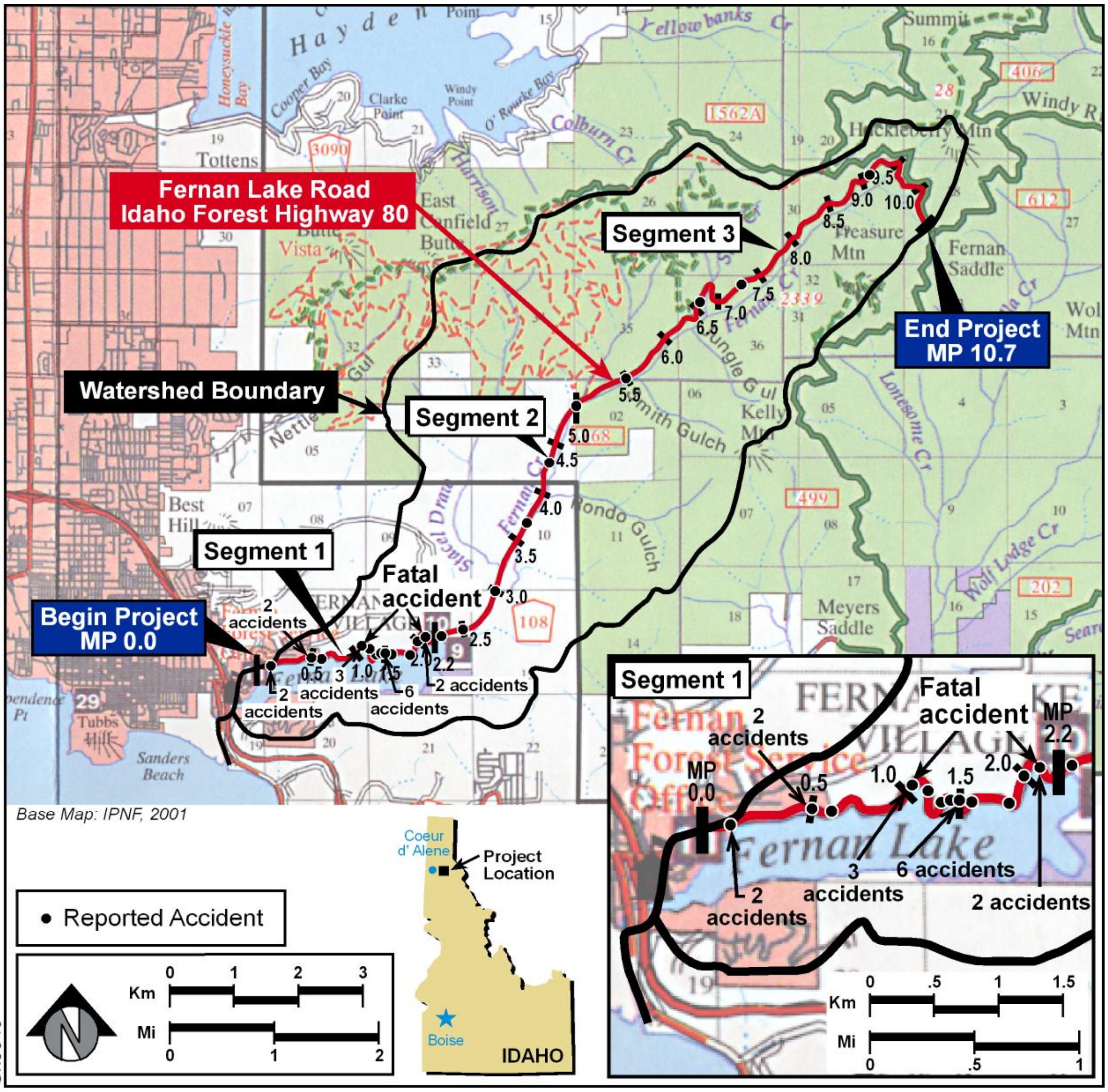

Figure 3-1. Distribution of Reported Traffic Accidents

Historical Crash Rates for Segment 2

Average crash, injury, and fatality rates for Segment 2 are much lower than for Segment 1 and much closer to statewide averages for the six-year analysis period. There have been only two crashes in Segment 2 during the six-year period. The average crash rate (0.78/mvm) is about half the statewide average. The average injury rate (0.78/mvm) is 24 percent higher than the statewide average. There were no fatalities in Segment 2 between 1996 and 2001.

For state highways with volumes between 0 and 600 vehicles per day, ITD's Office of Highway Safety calculates a year 2000 crash rate of 1.49/mvm. There were no reported crashes in 2000 in Segment 2 of Fernan Lake Road, and the six-year average crash rate (0.78/mvm) for Segment 2 is just over half the year 2000 statewide average rate of 1.49.

Historical Crash Rates for Segment 3

Average crash, injury, and fatality rates for Segment 3 are closer than Segment 1 to statewide averages for the six-year analysis period. Four crashes, all in 2001, have been reported, giving a six-year average crash rate of 1.93/mvm. This average is about 20 percent higher than the statewide average. The average injury rate (0.48/mvm) is lower than the statewide average. Only one injury has been reported for Segment 3 in six years. There were no fatalities in Segment 3 between 1996 and 2001.

For state highways with volumes between 0 and 600 vehicles per day, ITD's Office of Highway Safety calculates a year 2000 crash rate of 1.49/mvm. There were no reported crashes in Segment 3 in 2000, but the six-year crash rate of 1.93/mvm is 30 percent higher than the statewide average of 1.49/mvm.

Conclusions from the Review of Crash Data

The number of crashes recorded over the ten-year period is relatively small, with the average number of crashes per year being just over three. The number of crashes per year varies from zero in 1992 to a high of eleven in 2001. It is therefore important to be aware of the limitations and pitfalls of any statistical analysis, including the reliability of the database and the possible under-reporting of crashes, particularly when the number of recorded crashes is relatively small. It is known, however, that a number of crashes have gone unreported during the review period, so crash rates along Fernan Lake Road are likely to be higher than similar roads in the state. This is particularly evident in Segment 1, where the crash rates for the reported crashes are significantly higher than the statewide averages.

It is not uncommon for periods with relatively high crash frequency to be followed by periods of low crash frequency, even though no improvement measures have been implemented. Care should therefore be taken in the interpretation of the available data to ensure that where conclusions are drawn, they are soundly based and not on factors occurring through chance.

Two of the 33 crashes recorded were fatalities and accordingly they represent a high percentage of the overall number of crashes. Again conclusions should be treated with caution because of the low total number of crashes occurring in the study area. However, a relatively higher rate of fatalities may be expected on this highway because of the higher exposure to roadside hazards.

The vast majority of reported crashes are single vehicle crashes with speeding as the critical contributing factor. These crashes did not tend to occur in difficult or adverse weather conditions and most occurred during daylight hours.

All of the multiple vehicle crashes that did occur were along Fernan Lake within the limits of Segment 1. Six of the seven total multi-vehicle accidents occurred on curved sections of the roadway.

Crash Prediction

The IHSDM Crash Prediction Model

The Interactive Highway Safety Design Model (IHSDM) is road safety evaluation software that evaluates the potential safety impact of specific geometric designs for roads and highways. It combines elements of each of the four traditional methods of estimating current or future safety performance for a roadway into an crash prediction algorithm, minimizing the significant weaknesses of each of the traditional methods when used alone. These traditional methods include: estimating from historical crash data; predicting from statistical models; estimating from before-and-after studies; and applying expert judgment by experienced engineers.

IHSDM was published by the FHWA (2001) and is based upon dividing a planned or existing corridor into homogeneous segments. A list of geometric and other data is then extracted from each segment and entered into a crash prediction algorithm. The total predicted crash frequency for the corridor is determined from the sum of combining all the segments.

The prediction model and crash modification factors in IHSDM are applicable for two-lane rural roads and can be applied to both segments and intersections. Applying the IHSDM crash prediction model for the existing and proposed build alignments enables more quantitative consideration of the safety implications of geometric design elements to aid decision-making.

For quantitative analysis, the entire road must be divided into segments. When one segment finishes, another one starts at the same point. When a steep grade for example starts part way through a tight horizontal curve, a new segment is created for the change in grade, but the full length of the horizontal curve is measured.

Judgment is required to ascertain what constitutes the start and finish of a new homogeneous segment. The same criteria devised from the sensitivity analysis presented in FHWA (2001, pages 51-64) was used to assess Alternatives E, Fm, and Preferred Alternative G (ET 2003a, 2003b, 2003c). Earth Tech's report (2002) includes a discussion of some of these limitations in the context of Fernan Lake Road evaluation.

IHSDM Results

The build alternatives were evaluated with respect to safety performance. In determining the safety performance for the existing conditions and for all build alternatives, a procedure (as described in the IHSDM manual) is applied to proportion the total expected crash frequency into two severity categories: (1) fatal or injury (F + I) and (2) property damage only (PDO).

As expected, the estimated crash frequency increases as the projected traffic volume on the study corridor grows over time. The estimated crash frequencies shown in Table 3-3 are annual frequency (i.e., crashes per year). For all results, the corridor is divided into Segment 1 and Segment 2, showing the estimated safety performance for each segment, as well as a total for both segments.

Table 3-3. Predicted Annual Accidents (crashes/year)

Accident Type/Alternative	Total (1 and 2) 2002	Total (1 and 2) 2026	Segment 1 2002	Segment 1 2026	Segment 2 2002	Segment 2 2026
Fatality and Injury						
Existing/No Action	2.6	5.3	1.7	3.5	0.9	1.8
Alternative E	1.1	2.0	0.9	1.6	0.2	0.4
Alternative Fm	1.2	2.3	1.0	1.9	0.2	0.4
Alternative G*	1.1	2.0	0.9	1.7	0.2	0.3
Personal Property Only						
Existing/No Action	5.5	11.0	3.6	7.3	1.9	3.7
Alternative E	2.3	4.3	1.8	3.4	0.5	0.9
Alternative Fm	2.6	4.9	2.2	4.1	0.4	0.8
Alternative G*	2.3	4.2	1.9	3.5	0.4	0.7
Total						
Existing/No Action	8.1	16.3	5.3	10.8	2.8	5.5
Alternative E	3.4	6.3	2.7	5.0	0.7	1.3
Alternative Fm	3.8	7.2	3.2	6.0	0.6	1.2
Alternative G*	3.4	6.2	2.8	5.2	0.6	1.0

* Preferred Alternative

The design features contained in all build alternatives resulted in an overall improvement of 53 percent to 58 percent to the estimated safety performance in 2002 for Segments 1 and 2 combined. When compared to existing conditions for accident predictions in 2026, the build alternatives improved safety by 56 percent to 62 percent when compared to the No Action Alternative.

Economic Evaluation of Safety Benefits

Safety benefits include the economic savings from crash mitigation associated with road improvements. In order to evaluate the safety benefits, an average cost per crash type was determined using the *2000 Idaho Traffic Collisions Report*, published by the Office of Highway Safety. The annual results were interpolated over the 25-year period to estimate the cumulative crash savings (Table 3-4). High and low cumulative values were calculated by using both a straight-line calculation as well as growth rate calculation, respectively (Table 3-5).

Table 3-4. 2002 and 2026 Safety Benefits for Fernan Lake Road Improvement Alternatives[1]

	Estimated Annual Crash Costs ($/year)[2]		Estimated Annual Benefits Compared to Existing Conditions ($/year)[2]	
	Year 2002	Year 2026	Year 2002	Year 2026
Existing Conditions	$475,106	$956,077	n/a	n/a
Alternative E	$199,427	$369,527	$275,679	$586,550
Alternative Fm	$222,889	$422,316	$252,217	$533,761
Alternative G[3]	$217,024	$416,450	$258,082	$539,627

[1]Source: ET, 2003d
[2]Values shown are in year 2000 dollars
[3] Preferred Alternative

Table 3-5. Cumulative Effects of Implementing the Build Alternatives

	Total Number of Crashes Predicted to Occur Between 2002 and 2026		Total Number of Crashes Predicted to be Eliminated Between 2002 and 2026		Cumulative Value of Safety Benefits of Implementing a Build Alternative Between 2002 and 2026[1]	
	Low	High	Low	High	Low	High
No Action Alternative	293.6	305.0	n/a	n/a	n/a	n/a
Alternative E	117.7	121.3	175.9	183.7	$10,310,000	$10,780,000
Alternative Fm	133.2	137.5	160.4	167.5	$9,410,000	$9,820,000
Alternative G[2]	116.7	120.0	177.0	185.0	$10,470,000	$10,920,000

[1]Values shown are in year 2000 dollars
[2] Preferred Alternative

Environmental Commitments and Mitigation

1. The contractor will be required to perform work in a manner that assures the safety and convenience of the public and protects the residents and property adjacent to the project during construction.

2. The roadway will be maintained in a safe and acceptable condition, including periods when work is not in progress. The contractor will maintain intersections with roads and residences.

3. All zoning and other local regulations apply to impacts from traffic and circulation changes. A traffic management plan would be developed for different stages of construction.

4. Signage and other means of communicating the location and duration of road closures to local residents will be required as part of the construction contract to assist road users in scheduling travel times.

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3.2 HYDRAULICS

Drainage Basins

The project is entirely within the Fernan Creek/Fernan Lake drainage basin. Total drainage area for the basin, including the outlet between Fernan and Coeur d'Alene lakes, is 50.8 square kilometers (km^2) (19.6 square miles [mi^2]) (FEMA, 1984b). Approximately 4,900 ha (12,000 acres) drain to Fernan Creek and Fernan Lake (DEA 2003, FLWTAC 2003). Fernan Lake Road intercepts drainage from approximately one-half of lake/creek drainage area.

There are four major stream or water crossings (Figure 3-2) that collectively drain approximately 1,680 ha (4,150 acres).

- Lilypad Bay crossing at approximately MP 2.1 (Segment 1)
- Stacel Draw at approximately MP 3.2 (Segment 2)
- Dry Gulch at approximately MP 5.4 (Segment 3)
- State Creek at approximately MP 7.0 (Segment 3)

There are also numerous sub-basins and minor culvert crossings. Topographic survey data for this project were available only for Segments 1 and 2, so minor culverts have been located only in those two segments.

Conveyance

The proposed typical roadway section is crowned for the majority of the alignment, with a variable cross-slope, and super-elevated curve sections. The north side of the road drains to a "rock fall" ditch, while the south side of the road sheet flows over the water quality filter shoulder to the lake or creek depending on the location along the alignment. Roadway drainage would also be passed through water quality swales where topographic considerations permit.

Enclosed Conveyance

Each of the build alternatives (Alternatives E, Fm, and Preferred Alternative G) proposes to use some type of enclosed conveyance system for stormwater runoff. The alternatives each propose to install new or relined cross culverts at existing drainage crossing locations. In Segments 1 and 2 new culverts would replace existing culverts and be added in sections where the distance between existing culvert crossings exceed 305 m (1000 ft). Additional culvert crossings may be required upon final design of the roadway profile, adjacent ditches and water quality swales. Culverts in Segment 3 would be relined except at Dry Gulch where a larger culvert is needed.

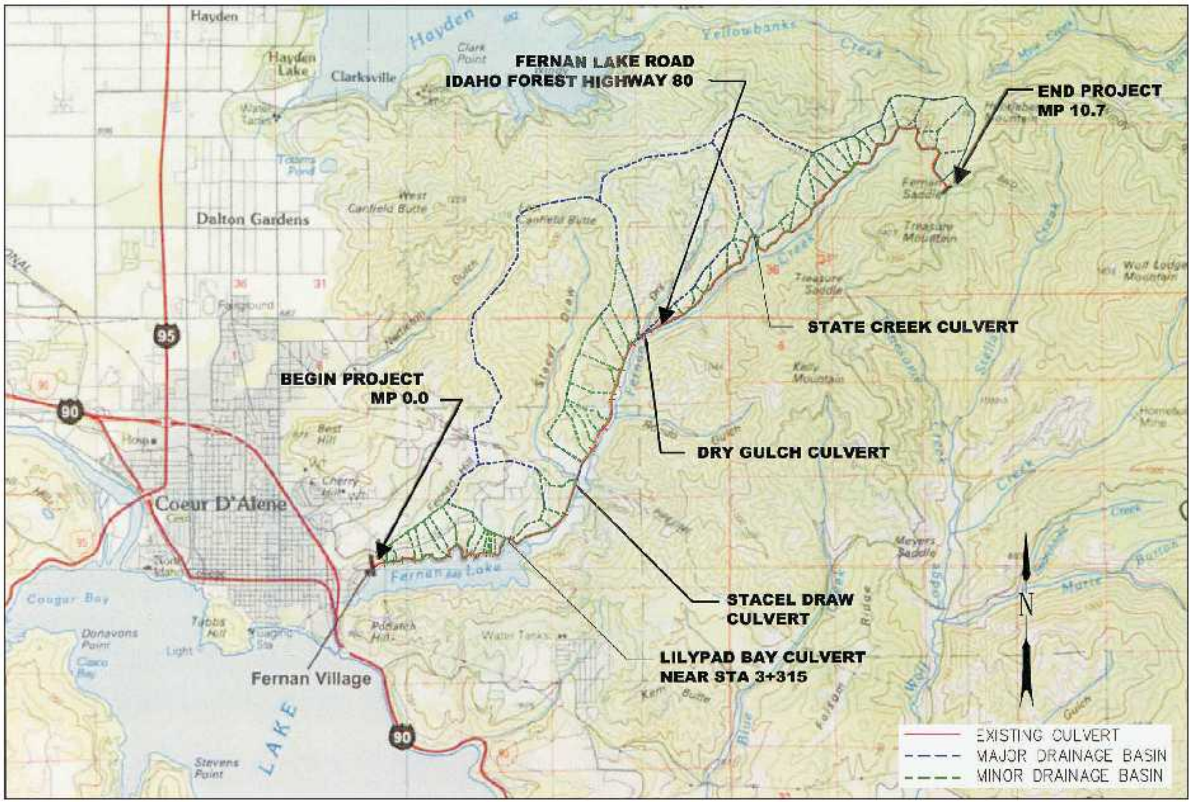

Figure 3-2. Drainage Basins along Fernan Lake Road

In addition, each build alternative proposes to employ drop inlets intermittently located on the north side of the road at the base of the cut slope retaining walls in Segment 1. The drop inlets would collect the stormwater runoff at the base of the walls after it has passed through a water quality swale and convey it under the road toward the lake.

Ditch Conveyance

Each of the build alternatives proposes to employ roadside ditches to convey stormwater runoff. Where possible, the lower reaches of the ditches would be designed and constructed as water quality swales.

Alternative E and Preferred Alternative G each have a similarly proposed vertical alignment for Segment 1, which roughly follows the existing Fernan Lake Road profile. For these alternatives the typical grades in Segment 1 fall between 0.5 and 1.5 percent. The maximum grade experienced in Segment 1 for these same alternatives is approximately 2.0 percent, which occurs at the approach ends of each alternative's proposed bridge.

Alternative Fm roughly follows the existing Fernan Lake Road profile for only a portion of Segment 1 before taking an upland route, which bypasses many of the sharpest horizontal curves along the existing alignment. This upland bypass route requires relatively steep grades to reach the plateau before descending relatively steeply prior to

Lilypad Bay. The maximum grade experienced in Segment 1 for Alternative Fm is 7.5 percent. The steep grade of this alternative would require consideration for erosion prevention along the ditch slopes and at their bases during final design.

Major Culvert Crossings

Four major culvert crossings are indicated, along with the maximum drainage areas for culvert sizes, ranging from 600-mm (2-ft) to 3000-mm (10-ft) diameter corrugated metal pipe (CMP). The four major culvert crossings are described further below. Where invert elevations and design information were not available, road elevations, culvert design and tailwater conditions were assumed.

Lilypad Bay, MP 2.1 Culvert Crossing

The existing culvert has a tributary area of approximately 1.58 km^2 (0.61 mi^2). The existing culvert consists of a 460-mm (1.5-ft) diameter CMP. Alternative E and Preferred Alternative G would replace the existing failed culvert with a bridge proposed across Lilypad Bay.

Alternative Fm would move the Fernan Lake Road alignment past Lilypad Bay north of the existing causeway/alignment and require one or more new culverts.

Analysis showed that a 600-mm (2-ft) CMP culvert, the minimum diameter per FHWA standards, would be adequate to meet the HW/D criteria with a ratio of 1.43.

Depending on the final approach for the Lilypad Bay crossing, further hydraulic analysis will be required. The failed culvert on Fernan Lake Road in this vicinity would be removed with the rest of the causeway fill, restoring hydrologic connectivity throughout the bay.

Stacel Draw, MP 3.3 Culvert Crossing

The Stacel Draw culvert has a tributary area of approximately 7.2 km^2 (2.8 mi^2). The existing road culvert consists of twin 900-mm (3-ft) diameter CMP culverts.

Based on an analysis, a proposed 2050-mm x 1500-mm (7-ft x 5-ft) pipe arch culvert would be required to meet the HW/D criteria, with a ratio of 1.2. An 1800-mm (6-ft) culvert is recommended.

Currently there are twin 0.9-m (3-ft) diameter culverts at Stacel Draw (MP 3.3).

Dry Gulch, MP 5.4 Culvert Crossing

The Dry Gulch culvert has a tributary area of approximately 5.23 km^2 (2.02 mi^2). The existing stream crossing consists of a 1200-mm (4-ft) diameter CMP culvert.

Calculations for the Dry Gulch culvert have been made. Based on the analysis, a 1,500-mm (5-ft) culvert would be required to meet the HW/D criteria, with a ratio of 1.11.

State Creek, MP 7.0 Culvert Crossing
The State Creek culvert has a tributary area of approximately 2.25 km^2 (0.89 mi^2). The existing culvert is a 1500-mm (5-ft) diameter CMP culvert.

A 1,200-mm (4-ft) CMP culvert was evaluated and determined to be adequate, resulting in an HW/D of 0.98.

Minor Culvert Crossings
Only one of the minor drainage basins was analyzed with respect to its downstream culvert crossing. As a result, all of the culverts in Segments 1 and 2 with a diameter less than 600-mm (2-ft) will be replaced in order to meet FHWA design criteria. Culverts in Segments 1 and 2 with a diameter equal to or greater than 600-mm (2-ft) will either be relined, replaced, or remain in place depending upon the final field verification that occurs during final design.

The culvert with the highest flows was analyzed as a "worst case" to confirm that the 600-mm (2-ft) replacement culvert would be adequate. The 600-mm (2-ft) culvert resulted in an HW/D of 0.87, indicating the culvert would be adequate.

During final design, re-checking flows in all the cross-culverts and re-examining the existing culverts for their maintenance and flow capacity status is recommended.

Stormwater
The build alternatives would each widen Fernan Lake Road to a typical paved roadway width of 7.4 m (24 ft). The combined lengths of Segments 1 and 2 for Alternatives E, Fm, and Preferred Alternative G vary and are 7.9 km (4.9 mi), 8.0 km (5.0 mi), and 8.1 km (5.0 mi), respectively. Under each build alternative Segment 3 would be rehabilitated only, so no new impervious area would be added in this segment.

The existing impervious area for Fernan Lake Road is approximately 5.47 ha (13.5 acres). Alternatives E, Fm, and Preferred Alternative G would each add new impervious area. The approximate additional new impervious area for Alternatives E, Fm, and Preferred Alternative G is 1.33 ha (3.3 acres), 1.15 (2.8 acres), and 1.51 (3.8 acres), respectively.

Stormwater quality treatment for surface runoff from the roadway would be provided wherever practical and feasible. In some areas, providing extensive water quality facilities would force the roadway alignment into the hillside, greatly increasing the amount of required cut. The additional cut would greatly increase the potential for sediment entering the creek and lake. Therefore, water quality facilities would be designed to blend into the existing alignment.

Stormwater quality treatment systems would be designed to require minimal maintenance, while providing effective water quality treatment and efficient conveyance of stormwater during larger events. Native plants would be selected to maximize filtration and nutrient uptake with minimal maintenance during the establishment period and long term.

Water quality swales would be used where possible. Water quality swales utilize emergent plants in a gravel substrate to provide treatment. The design would minimize maintenance and maximize nutrient and sediment removal. In areas where swales cannot be used, a water quality vegetated filter would be constructed off the roadway shoulder. A flow spreader would distribute flow over the slope and planted with native grasses and shrubs to provide sediment and nutrient removal.

Fernan Creek

In the past Fernan Creek has been channelized through a number of reaches in the vicinity of Segment 2. The channelized creek segments are profoundly altered from their natural geomorphology. Proposed roadway fills under Alternatives E, Fm, and Preferred Alternative G in Segment 2 of Fernan Lake Road would impact the re-channelized and degraded segments of Fernan Creek in two major areas: from approximately MP 2.8 to MP 3.0 and from MP 3.6 to MP 3.9. To address the roadway fill impacts the relocation and restoration of approximately 900 m (3,000 ft) of the degraded creek segments is proposed as mitigation. The concept has been discussed but a preliminary design has not been developed with the permitting agencies, and there is no formal agreement for the channel work to occur at this time.

The relocated creek channel would be the same for all build alternatives. It would be designed to restore natural functions to the creek segments. The creek would be re-attached to its floodplain, providing shade, water quality improvement, and habitat. The channel restoration and channel section would be designed in accordance with the combined federal agency Stream Corridor Restoration: Principles, Practices, and Processes (USDA, 1998).

Conceptually, the relocated channel would have a compound channel with the low flow channel providing sediment transport capability and conveyance capacity to contain for the mean annual flow. The low flow channel would be protected with a degradable 400-gram (14.1-ounce) coir fabric to protect it and prevent untoward erosion during the channel seasoning period. The high-flow channel would be planted with native grasses, shrubs, and trees to provide riparian habitat, in addition to filtration and shade. The overall sinuosity of the relocated channel segments would be approximately 2.0. In accordance with USDA (1998), the loop radius of curvature for the relocation would vary between 5 and 15 m (16 and 50 ft) and the meander wavelength would vary from 25 to 50 m (80 and 160 ft). Site-specific surveys would be performed to facilitate final design of any build alternative.

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3.3 WATER QUALITY

Fernan Lake might be considered an urban lake because of its proximity to the City of Coeur d'Alene, but it is also picturesque and nearly completely surrounded by steep, forested mountains. Fernan Lake presents the combination of a lake with a heavily used road (on one shore) in a peaceful setting with a popular fishery. The lake's shallow depth gives it a productive fishery but also makes it susceptible to water-quality degradation and excess algae blooms.

IDEQ (1998) included Fernan Lake and the 1-km (0.7-mi) section of Fernan Creek below the lake on its 303(d) list for probable deterioration. Water bodies on this list have been determined to be water quality limited, i.e., they do not support designated beneficial uses. Fernan Lake was listed for nutrients, sediment, and dissolved oxygen. Fernan Creek between Fernan and Coeur d'Alene lakes was listed for nutrients, sediment, and habitat alterations. Management priority was rated as "low" for both the lake and outlet. The listing of Fernan Creek is in line with listings of other comparably sized streams in northern Idaho with similar intensity of use. Creeks with heavily used, adjacent paved roads are often listed.

In its Subbasin Assessment for the Coeur d'Alene Lake basin, IDEQ recommended that Fernan Lake be removed from the 303(d) list of impaired water bodies with nutrients as the pollutant of concern (IDEQ, 1999). Currently Fernan Lake and its outlet creek are on the 303(d) list, but Fernan Creek above the lake is not.

Fernan Lake and Creek are not pristine waters. They are in a forested, rural watershed with their present condition determined by the combination of natural runoff and all uses in the watershed, including timber harvesting, forest roads, highway runoff, agriculture, grazing, residential development, and recreation.

Watershed Vegetation

Ponderosa pine (*Pinus ponderosa*) dominates the timber cover of the drier, south-facing slopes with sparse understory. Lower elevation slopes down to the Fernan Lake north shore are even drier with nearly single-species stands of ponderosa pine. The widely spaced trees there permit a low ground cover dominated by grasses. On the more moist north-facing south shorelines, Douglas fir (*Pseudostuga menziesii*) predominates the thicker overstory. A dense shrub understory and reduced grass cover are present where timber openings permit. On the roadless south shore, timber and shrub cover overhangs the lake shoreline.

Human Influence on Fernan Lake

Segment 1

Fernan Lake Village consists of a small concentration of mostly year-round homes located on the northwest shore of the lake. Sewer services were added in the late 1970s (Akuff, 2002), so the village's major impacts on the lake now are runoff from roofs, driveways, and parking areas; infiltration from fertilized yards; high-density shoreline use (albeit from a small area); and boating. Fernan Lake Village's impacts on the lake are probably minimal lake-wide because of the village's proximity to the lake outlet. Fernan Lake Village occupies approximately 7 percent of the lake's shoreline.

Fernan Lake Road parallels the north shore of Fernan Lake from MP 0.1 at the northeast corner of Fernan Lake Village to the east end of the lake at MP 2.2. The road is immediately adjacent to Fernan Lake and is narrow, has numerous sharp curves, a failing subgrade, a deteriorating road surface and substandard horizontal alignment. Because of the road's condition and proximity to the lake, it contributes to sedimentation and nutrient loading into the lake as evidenced by numerous water-cut gullies, wash-slopes, and fine sediment deposits down to the water.

Fernan Lake drains through large culverts under I-90 and Coeur d'Alene Lake Drive

Segments 2 and 3

Mossier (1993) considered stormwater runoff and riparian disturbance along Fernan Creek above Fernan Lake to be major concerns for nutrient and sediment inputs. He recommended control of road runoff and riparian stabilization as major management actions to protect water quality in the watershed. Mossier stated that domestic water supply uses were "threatened" because of intense human activity on and around the lake, but no livestock or farming activities were detailed.

Small lakes in northern Idaho have been shown to be sensitive to farming and livestock grazing when those activities are in sufficient density and proximity to tributary streams or the lake itself (Falter and Good, 1987; Falter and Hallock, 1987, in research on Cocolalla and Twin Lakes, respectively). Farming and grazing impacts in the Fernan drainage would be limited to tributary streams and along Fernan Creek, rather than directly to the lake. Impacts from farming and grazing to these Fernan Lake tributaries have not been documented but could be significant where riparian zones have been degraded. Such is the case along the lower half of Fernan Creek.

Inflowing Stream Hydrology

Water Volume

Fernan Creek is the lake's major perennial inlet flowing into the east end of the lake. The creek receives flow from Stacel Draw (MP 3.2), Rondo Gulch (MP 4.4), Dry Gulch (MP 5.4), Smith Gulch (MP 5.8), Jungle Gulch (MP 6.5), State Creek (MP 7.0), and upper Fernan Creek. Of these tributaries, Stacel Draw is probably the only stream with a consistently year-round flow to Fernan Creek. However, these streams contribute more water to the lake than their sometimes dry, intermittent channels

Portions of Fernan Creek in Segment 2 go dry in summer (view northwest near MP 3.6).

would indicate because of underground flows moving down-channel to the lake, as described below.

IDEQ conducted a water budget analysis of inflows to Fernan Lake from December 1999 to December 2000 (Harvey, 2001). IDEQ viewed the data as preliminary as of October 2001 because of the large residual difference between summary estimated inflows and outflows. Part of the difference is undoubtedly a result of the glacial flood alluvium underlying the lower stream valleys and lake basin. The lower stream reaches are most likely losing water into sub-gravel groundwater flows with that water eventually adding to the lake's inflow but unmeasured in the IDEQ study. All of the tributary streams go dry during extremely low-flow summers.

The IDEQ hydrological water budget shows that more than twice the water volume flows out of the lake than was gauged flowing into the lake via surface tributaries. Undergravel flows into the lake downstream of gauged sites likely account for that difference. This is a phenomenon seen with other lakes of the Rathdrum Prairie where the lakebeds are at least partially formed by deep gravel deposits causing underground, thus ungauged, water gains and/or losses (Falter and Hallock, 1987). The IDEQ study was never finalized (Rothrock, 2003).

Lake Basin Morphometry

Morphometry refers to the shape of a lake basin and includes a number of descriptive parameters such as volume, surface area, mean depth, maximum depth, maximum length and width, and shoreline length.

Shape, Size, and Volume

Fernan Lake is roughly rectangular, trending west to east from the southeast border of Coeur d'Alene, to the Fernan Creek inflow. The lake basin fills the only low-gradient section of the Fernan Creek watershed.

The morphometric map (also called bathymetric map) in Figure 3-3 shows underwater contours from Mossier (1993) and earlier presented by Milligan et al. (1983). It is presented here for its depiction of the lake outline or shoreline. Depth measurements taken on September 8, 2001, were greater those than indicated by Mossier (Table 3-6).

Table 3-6. Examples of Differences in Depth Measurements from Two Sources: Mossier in 1993 and DEA in 2001

Location points as shown in Figure 3-3	Depths reported by Mossier in 1993	Depths recorded by DEA in 2001
Point A, 10 m (33 ft) from shore	less than 1 m (3 ft)	4 m (13 ft)
Point A, 20 m (66 ft) from shore	approximately 1.5 m (5 ft)	6.5 m (21 ft)
Point B, 40 m (131 ft) from shore	approximately 1.0 m (3 ft)	5.5 m (18 ft)
Point C, 10 m (33 ft) from shore	approximately 2.0 m (6.5 ft)	6.0 m (20 ft)

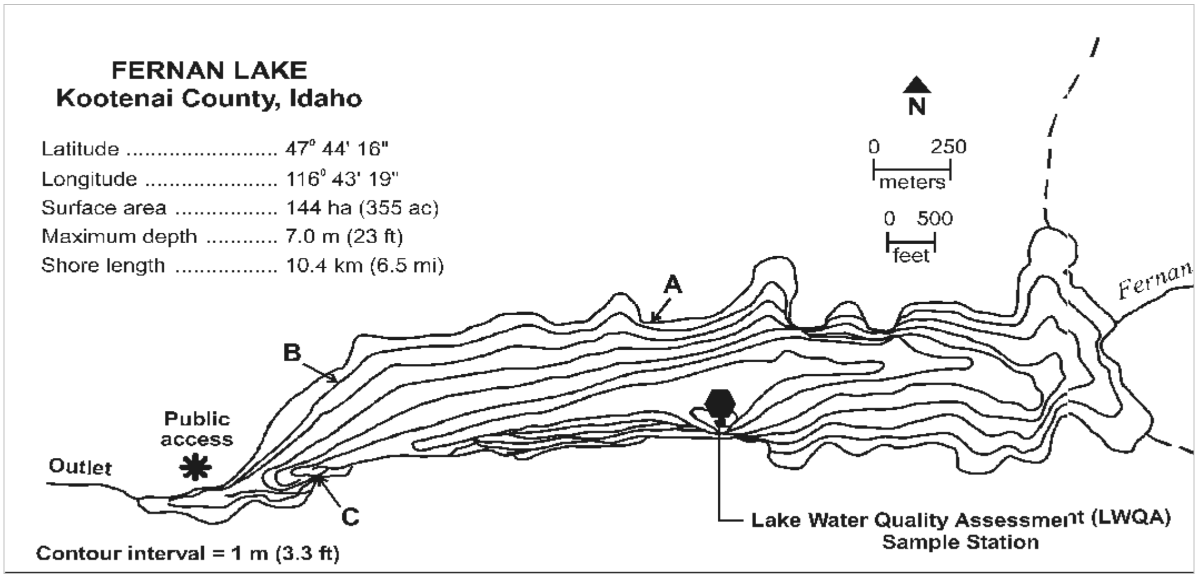

Figure 3-3. Morphometric Map of Fernan Lake

The major difference between the two sets of measurements is that DEA found Fernan Lake to be more steep-sided and flat-bottomed than the gently sloping V-shaped basin depicted by Mossier (Mossier's depiction of the shallow east end of the lake and the steep southwest shore agrees with the DEA's observations). The implications of this discrepancy are that Fernan Lake has a much greater volume than depicted by Mossier and that most of the lake's shorelines are steeper than depicted by Mossier. A steeper north shore gives the lake much greater sediment absorption capacity on the north shore than indicated by Mossier.

A mean depth of 3 m (10 ft) would give the lake a volume of 3,550 ac ft, but based on the September 2001 soundings, the mean depth is clearly greater. A mean depth of 6 m (19.7 ft) would make the volume 6,000 ac ft. However, the September 2001 soundings were not taken to map the lake bottom and may overstate the volume. An average of the two estimates (4,770 ac ft) is a numerically conservative estimate of lake volume at this time.

There is limited opportunity for rooted aquatic plant development off the steep shores since the bottom deepens rapidly to light-limiting depths (in Fernan Lake, less than 4 m [13 ft]). The steep underwater shorelines are rock talus rubble undesirable for rooted plant development. The talus is either from road construction combined with natural rock talus on the north shore or natural rock talus on the steep south shoreline.

Fernan Lake is not a deep lake and the volume-to-surface-area ratio is low, ensuring a tendency towards top-to-bottom lake mixing throughout the summer, absence of thermal stratification, more light reaching the bottom, and more sustained nutrient re-supply to well-lit surface waters through the summer-fall period. These factors suggest a more productive trophic status but that the lake is not likely to experience either a stratified hypolimnion (deep, cold, isolated water layer beneath a warmer surface layer in the summer-fall period) or the accompanying deep-water oxygen depletion.

Shoreline Characteristics
Fernan Lake shorelines are steep and dominated by angular cobble and gravel. Exceptions are:

- the gradually sloping yards of the homes in Fernan Lake Village on the northwest shore;
- bank fishing access areas on the north shore consisting of coarse sand; and
- the northeast inlet (Lilypad Bay) and Fernan Creek inlet where organic muck and wetland soils have created a shallow, flat lake bottom.

With the exception of the Lilypad Bay and Fernan Creek inlet areas, the lake does not appear to be surrounded by a defined riparian zone (areas in which the plant community consists primarily of hydrophytes and soils are waterlogged much of the year). Instead, drier hillslope soils and vegetation extend down to the waterline. Except for areas on the north shore where foot trails are eroding, most of the talus shorelines appear to be stable.


Foot trails between the road and the lake contribute to erosion along the north shore.

Lake Limnology

Limnology is the study of fresh and saline waters contained within continental boundaries and include lakes, ponds, reservoirs, streams, rivers, wetlands, and estuaries (Horne and Goldman, 1994). Study of these water bodies includes water supply and lake level, estimated hydraulic retention time (HRT), and water column conditions.

Water Supply and Lake Level
A stable water level in the lake is usually beneficial to both shoreline property owners and the lake's fishery. For much of the year, the outlet dam controls Fernan Lake's water level across Fernan Creek, west of the stream culverts under I-90 and Coeur d'Alene Lake Drive. On September 8, 2001, following a dry summer, Fernan Lake's surface level was 0.4 m (1.3 ft) below full lake level. At the end of September 2003, there was no flow through the I-90 culvert and the lake was 0.7 m (over 2 ft) below the top of the outlet dam.


A small water level control structure is located between Fernan Lake and Coeur d'Alene Lake.

Water Column Conditions

Temperature

Water temperature data on Fernan Lake are available from Mossier (1993) for a five-month period (May to October 1990). Mossier's data show that slight thermal stratification began in late May 1990 as surface temperatures rose to 15.5^{o}C (59.9^{o}F), while deeper water below 4 m (13 ft) remained around 13.5^{o}C (38.3^{o}F). By mid-summer, however, temperature and oxygen profiles in July 1990 from Mossier (1993) show an absence of vertical stratification at least to a depth of 4 m (13 ft). Lake temperature attained maximal heat content several weeks later in early August when the temperature at 0-2 m (0-6.5 ft) was around 24^{o}C (75.2^{o}F), at 6 m (20 ft) 22^{o}C (71.6^{o}F), and at 7 m (23 ft) 20.4^{o}C (68.7^{o}F). In late summer, the 4^{o}C (7.2^{o}F) difference from surface to bottom in that temperature range was sufficient to cause the observed moderate vertical stratification or isolation of the surface layer from the deepest bottom layer of the lake. By the end of October, the lake was homothermous top to bottom at 8.7^{o}C (47.7^{o}F). Time of ice formation or ice-out is not available for the year evaluated in Mossier's study, but the lake does develop an ice cover every year. There was no evidence of thermal stratification in 2003 (FLWTAC, 2003)

Water Clarity

In 1990, Secchi transparency or depth (a measure of water clarity) ranged from 2.2 m (7.2 ft) to 4.5 m (14.8 ft) with a mean of 3.1 m (10.2 ft). In 1991, the mean transparency was 3.3 m (10.8 ft). Mossier (1993) concluded that the chief determinant of water transparency in Fernan Lake was biotic turbidity from blue-green algae blooms, not silt. Milligan et al. (1983) measured mid-summer Secchi depth of 3.0 m (9.8 ft) with the photic zone determined to extend to the bottom. Secchi depth was 3.0 m (9.8 ft) in September 1993 (IDFG, 1993) and 2.0 m (6.6 ft) in August 1997 (IDEQ, 1997). On September 8, 2001, Secchi transparency was 3.5 m (11.5 ft) with a moderate blue-green bloom.

Secchi transparency ranged from 1.1 to 4.3 m (3.6 to 14 ft) in Summer 2003. Values were greater than 3.3 m (11 ft) through July, then abruptly declined to 2.3 m (7.4 ft) in early August, and continued to decline until the study ended in mid-September. Secchi depths less than 2.0 m (5.4 ft) coincided with high chlorophyll *a* concentrations, supporting Mossier's conclusion that algae rather than suspended sediments are the primary factor affecting water clarity in Fernan Lake.

Dissolved Oxygen

Mossier (1993) found dissolved oxygen of 9.4 mg/l in May 1990 with oxygen declining to 7.5 mg/l at 6 m (19.7 ft). With warming water in July and August (warmer water holds less oxygen), surface oxygen dropped to 8.2 mg/l. Summer deep-water oxygen declined to 3.6 and 0.8 mg/l at 7 m (23 ft) although values at 6 m (19.7 ft) were 4.1 and 5.1 mg/l in July and August, respectively. By early September, at a depth of 7 m (23 ft), oxygen had risen to 7.6 mg/l. To sustain cold-water biota, dissolved oxygen levels above 4 to 5 mg/l are required (Horne and Goldman, 1994).

Even during periods of moderately high summer algae growth, supersaturation of dissolved oxygen was not observed in Fernan Lake. In eutrophic waters, very high summer algae blooms may produce oxygen supersaturation near the surface. The fact that oxygen supersaturation has not been observed in Fernan Lake suggests that only modest algae production is present. This condition has not changed over the past 20 years, indicating a stable oxygen content.

The absence of a stable thermocline and very low dissolved oxygen waters below it indicates that phosphates, which promote algal growth, are not being released from bottom sediments in Fernan Lake during summer. Because of Fernan Lake's shallow depth, internal phosphorus loading related to anoxic bottom waters either does not occur or only occurs to a very minor extent.

Plant Nutrients

Nutrient management of lakes typically focuses on phosphorus and nitrogen availability. Most surface water bodies of northern Idaho are phosphorus-limited, i.e., at any given time in a lake, phosphorus is the plant nutrient most limiting to algae growth. If more phosphorus is added, it is likely that more algae growth will result. Nitrogen is usually the second limiting nutrient.

Mossier assessed total phosphorus (TP) and dissolved phosphorus (DP) in Fernan Lake in 1990. Concentrations of TP varied from 13 to 30 micrograms total phosphorus per liter (μg TP/l). Seasonal trends were not apparent with TP but were with DP when late-summer algae uptake removed all DP from the water. DP was low, always less than or equal to 3 μg/l, but dropped below detection limits in September when algae activity was high. Algae growth depletes DP to very low levels, supporting the contention that phosphorus is probably the first limiting nutrient in Fernan Lake. Milligan found a mid-summer TP of 29 μg/l.

Mossier found total nitrogen (TN) to range from 300 to 600 μg/l. The TN:TP ratio gives some indication of nutrient limitation between TN and TP. Nitrogen may likely be limiting when this ratio is less than 15 while phosphorus is likely to limit algae growth when the ratio is greater than 15. In May, June, August, September, and October 1990, the average TN:TP ratios in the lake were 23, 15, 35, 20, and 19, respectively. Phosphorus limitation is thus indicated for most of the growing season. The ratio was lowest (15) in June, suggesting possible nitrogen limitation early in the summer. Such nitrogen limitation then would not be unexpected considering that early in the season, blue-green algae would likely not be at population levels high enough to fix atmospheric nitrogen. Nitrogen scarcity could be expected then.

Nutrient Loading

IDEQ gauged Fernan Creek inflow and the lake outflow (below project area) from December 1999 through December 2000 (Harvey, 2001). Principal sources for TP were Fernan Creek inflow (44 percent), precipitation (47 percent), and ungauged surface inflows (9 percent). Fernan Creek outflow accounted for 96 percent of TP loss from the lake while infiltration into the Rathdrum Prairie accounted for 4 percent. It is unusual for such a high percentage of TP inflow to leave the lake via a surface outflow. The strong affinity of phosphorus for sediments, especially when they remain aerobic, usually results in about 50 percent of inflowing TP being permanently lost to lake sediments. Even when anaerobic sediments release large amounts of soluble phosphorus, lake outflows usually do not account for more than 70 percent of inflowing TP. IDEQ considers the loading data provisional so more cannot be made of these inflow-outflow comparisons at this time (Harvey, 2001).

Sewer services were added to Fernan Lake Village (on the west end of Fernan Lake) in the early 1970s. Aquatic sediments at a depth of 4 to 5 m (13 to 16 ft) and an off-shore distance from Fernan Lake Village of 50 to 100 m (164 to 328 ft) are flocculent, dark brown deposits, indicative of high organic content and elevated nutrients. Stormwater runoff and non-point loading from driveways, lawns, and boating activities probably account for the enriched nature of sediments off Fernan Lake Village since they are the only apparent contributors adjacent to this region of the lake.

Trophic Status of Fernan Lake

Fernan Lake is a northern latitude lake with a trophic state in which chlorophyll *a* is the principal determinant of transparency and phosphorus is the principal determinant of chlorophyll *a* (EPA, 1990b). Observed transparency and chlorophyll *a* of Fernan Lake both fall in the low mesotrophic range of productivity, at a combined Carlson's Trophic State Index (TSI) (EPA, 1990b) of approximately 43. Mean total phosphorus concentration places the lake in a high mesotrophic or middle range of productivity, at a TSI of 50. TSI simply indicates the current trophic status with no indication of change rate.

Mossier (1993) considered the lake to be "mesotrophic to late-mesotrophic," i.e., moderately productive. Milligan et al. (1983) also ranked Fernan Lake as mesotrophic. In summarizing historical water quality data prior to 2003, Rothrock (in FLWTAC, 2003) concludes Fernan Lake is susceptible to further eutrophication and has a propensity toward blue-green algae blooms. Issacson concluded that the lake clearly exhibited eutrophic characteristics from late August through mid-September 2003, based on chlorophyll *a* and Secchi transparency measurements (FLWTAC, 2003).

The theoretical approach is to express phosphorus loading per unit of lake surface area and compare the value to water loading to the lake (Falter and Hallock, 1987; EPA, 1990b). Figure 3-4 shows this plot with oligotrophic and eutrophic lake response zones drawn on the plot. Fernan Lake is plotted here along with several regional lakes for comparison. The plot shows that Fernan Lake TP loading estimates from IDEQ exceeds "permissible" TP loading and falls solidly in the range that would indicate the lake is eutrophic, based on a TP loading of 0.78 g/m^2 of lake surface.

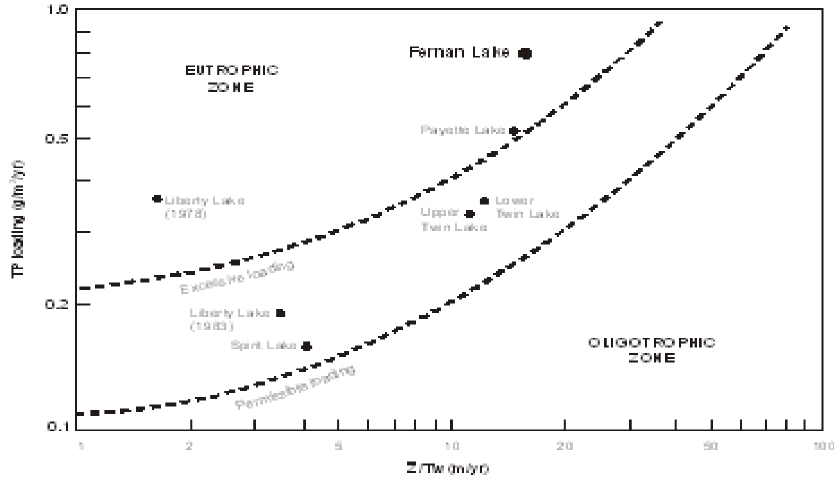

Figure 3-4. Lake Trophic State based on Phosphorus Loading

Existing TP loading data (Harvey, 2001) and high estimated TP concentrations in the lake (from TP loading) both predict a productive, eutrophic lake. Measured algae chlorophyll concentrations fall far short of projected chlorophyll concentrations based on TP loading. Overestimates of water loading and TP loading are most likely the reason for the lake's actual TP and algae production falling short of the eutrophic predictions. Based on the observed Secchi transparency of the lake (Milligan et al., 1983; Mossier, 1993; DEA's 2001 measurements), the lake is in a mesotrophic state and has been for at least 21 years.

Sediments and Plant Communities

Steep Talus Slopes on North and South Shores
The steep talus slopes on the north and south shores drop rapidly to flatter bottom areas at 5 to 7 m (16.4 to 23 ft). The slopes are undesirable habitat for aquatic macrophytes but are a productive zone for insects and crustaceans, which prefer hard substrate. This type of shoreline extends along 6 km (3.7 mi) or about 70 percent of the lake's shoreline. Periphytic algae (attached on the bottom) are well developed on the rock slopes down to about 3 m (10 ft). Light is limited deeper than 3 m (10 ft). Benthic macroinvertebrates utilizing these rocky slopes include caddisflies, mayflies, amphipods and grazing snails.

Lacustrine Sediments on the Deep, Central Bottom
Sediments on the deep, central bottom area of the lake have a uniformly small particle size in the fine silt to clay range, with a low organic content (probably around 5 percent organic content) as indicated by the light, chocolate brown, rather than a dark brown color, which would indicate a higher organic content. Three 13-cm (5-in) thick sediment samples from 6 to 6.5 m (20 to 21 ft) water depth taken in this region on September 8, 2001, had a fresh, earthy smell, indicative of high dissolved oxygen throughout deep regions of the lake, typical of lake sediments in early fall after lake overturn. The surface of the sediment samples had a fine orange layer several millimeters thick. This is an oxidized microzone, a patina of $Fe(OH)_3$, $Fe_2(CO_3)_3$, and Fe_2O_3, which has accumulated

on the sediments after precipitating out of the water column. This type of sediment occurs only below an aerobic, oxygenated water column. In these sediment samples there was no visual evidence of black, reducing (low oxidation-reduction potential) varves (produced as summer or winter layers of accumulated sediments). These aerobic sediments are therefore likely to occur year-round. Otherwise, the persistent varves would be visible. A diverse, productive bottom community is more likely in the types of sediments found in the samples.

Sediments from the deep, central lake bottom indicated low organic content.

Lacrustrine Sediments on Shallower, Flat Bottom Areas

Lacrustrine sediments on shallower, flat bottom areas occur in three areas: at a depth of 0 to 3 m (0 to 10 ft), in the outlet bay off-shore of Fernan Lake Village, and in the three east-end inlets. These aquatic sediment habitats are classified in the National Wetlands Inventory (NWI) system as L2AB4H (lacustrine, littoral, aquatic bed, floating vascular, permanently flooded). Sediments here are fine-grained in the fine silt to clay range, but with more vegetative litter produced from shoreline terrestrial vegetation and from aquatic plants. They are darker brown than the deeper sediments described above, indicating higher organic content. Sediments off Fernan Lake Village are darkest, indicating highest organic content. Even so, the sediments were still aerobic. Sediments in the northeast inlet and Fernan Creek inlet had the most vegetative litter in September 2001.

Palustrine (Wetland) Sediments

These are extensive beds of emergent vegetation (cattails and rushes), classified as PEM1F (palustrine, emergent, persistent, semi-permanently flooded) in the NWI system, and drier riparian soils of the downstream 300 m (984 ft) of the northeast inlet and downstream 3 km (1.9 mi) of Fernan Creek. Vegetation here consists primarily of sedges and wet grasses, classified as PEM1C (palustrine, emergent, persistent, seasonally flooded) in the NWI system.

In the past, sediments in these areas probably had more inorganic silt content brought in by tributary streams, but inflowing creek waters are now filtered through these two types of wetlands shoreward of the lacustrine zone, described above. With much of the inorganic silts now being trapped by the two palustrine zones, sediments in shallow, lacustrine areas off the inlets have high organic content from intense emergent, submergent, and floating-leaved macrophyte activity.

Figure 3-5 shows locations of aquatic vegetation in Fernan Lake.

Figure 3-5. Aquatic Vegetation Beds in Fernan Lake (sources: USGS, 1987; DEA).

Near the Lilypad Bay road crossing, aquatic sediments have a 23 percent loss-of-weight-on-ignition (approximating organic content) (NTL, 2001). These sediments have been characterized as unconsolidated peat and organic silt down to a sediment depth of 7 m (23 ft). At a sediment depth of 7 to 20 m (23 to 66 ft), sediments are very soft silts with interbedded peat, organic clay, and sand. At a depth of 20 to 30 m (66 to 98 ft), well-graded sand, sandy silt, and silty sand soils dominate.

Fishery

The Fernan Lake fishery is considered by the Idaho Department of Fish and Game (IDFG) to be one of the finest urban fisheries in the state (IDFG, 2001b). The lake receives heavy angling use over most of the year. IDFG actively manages the fishery through selective regulations and fish stocking.

Fish Species

The fish community in Fernan Lake is a mix of cool- and warm-water species. Cutthroat trout (*Salmo clarki*) are the only confirmed native cold-water trout in the lake. Roper (1997) concluded in 1997 that in the past the lake probably did have bull trout (*Salvelinus confluentus*), a species presently listed as a Threatened under the ESA but knew of no recent reports of the species in the lake. Fernan Lake and Creek were not identified as critical habitat for bull trout recovery (DEA, 2003b). Mountain whitefish (*Prosopium williamsonii*), a non-trout salmonid native to the Lake Coeur d'Alene drainage, was likely native to Fernan Lake due to the hydraulic connectivity between the two water bodies, but present whitefish status in Fernan Lake is unknown. Rainbow trout (*Oncorhynchus mykiss*) and brook trout (*Salvelinus fontinalis*) have been introduced. The principal cool-water fishery at present is a put-and-take (regular plantings by IDFG) rainbow trout and fingerling cutthroat trout fishery. There are also some wild cutthroat trout and brook trout (IDFG, 2001a, 2001b).

The warm-water fish community of Fernan Lake is a diverse mix of introduced species (Roper, 1997) including largemouth bass (*Micropterus salmoides*), the principal warm-water species in the lake, smallmouth bass (*Micropterus dolomieu*) northern pike (*Esox lucius*), black crappie (*Pomoxis nigromaculatus*), yellow perch (*Perca flavescens*), pumpkinseed sunfish (*Lepomis gibbosus*), bluegill sunfish (*Lepomis macrochirus*), black bullhead catfish (*Ameiurus melas*), brown bullhead catfish (*Ictalurus nebulosus*), and channel catfish (*Ictalurus punctatus*). IDFG has two principal goals in management of the warm-water fishery: (1) to manage the bass for a consumptive fishery by allowing the harvest of all sizes, and (2) to enhance the diversity of the warm-water fish community by maintenance stocking of channel catfish (an effective predator). Northern pike density is low but large individual northern pike are sometimes caught. The IDFG would like to maintain angling pressure on the northern pike to keep populations low, thereby controlling predation pressure on other sport species (IDFG, 2001a).

Kootenai County Parks and Waterway maintains a fishing dock near MP 1.3.

Fishing boat access to the lake is provided by two public boat launches maintained by Kootenai County Parks and Waterways. One is at Fernan Park outside the project boundary on the west outlet of the lake in Fernan Lake Village, and the other at Fernan East within the project boundary on the northeast end of the lake. Boaters work the northeast and southeast embayments as well as the undeveloped south lakeshore.

Shoreline access for bank fishermen is found in areas around the boat launch docks and along most of the north-shore road. The County maintains a fishing dock near MP 1.3. Undeveloped but heavily used fishing trails between the north-shore road and the lake provide fishing access along the entire north lake shore up to the northeast shore wetlands. The trails are short but steep and eroding. There is no road access to the south shore.

Ice fishing on Fernan Lake is popular with yellow perch and an occasional trout the most common catches. Anglers use short rods or tip-ups with cutbait, maggots, or worms.

Fish Populations

Fish population data on Fernan Lake is available only for largemouth bass. Rieman (1987) conducted a population dynamics study of bass in six northern Idaho lakes including Fernan Lake. He determined that the number of bass in Fernan Lake larger than 150 mm (5.9 in) in total length was 5,000 (Standard Error [SE] = 440) in 1981 and 4,100 (SE = 540) in 1982. Mean bass numeric density in the two study years was 34 (SE = 3.0) and 28 (SE = 3.7) bass/ha, respectively. Mean bass biomass in the two study years was 6 kg/ha in both years. These numeric and weight densities were similar to those of Thompson and Medicine lakes in the Coeur d'Alene Lake system and Round Lake in the Pend Oreille system in northern Idaho. Fernan Lake densities were lower (27 percent in 1981 and 55 percent in 1982) than those in Robinson and Perkins lakes, two northern Idaho lakes in the Kootenai River system (Rieman, 1987).

Fish Age and Growth
Mean age of bass was lower in Fernan Lake than in seven other northern Idaho lakes. Mean age of Fernan Lake bass 4 years and older was 4.6 years, significantly lower than in the other lakes. Growth coefficients of bass in Fernan Lake were lowest of the eight studied lakes (Rieman, 1987).

Bass up to 53 cm (21 in) have been caught in Fernan Lake. Channel catfish are caught at average lengths of 31 to 48 cm (12 to 19 in).

Fish Mortality
Total annual mortality of Fernan Lake bass in the Rieman study was 0.73, meaning that a large bass in Fernan Lake has a 73 percent chance of dying in any given year, a figure higher than for six of the other seven lakes studied (Rieman, 1987). Natural mortality in Fernan Lake was 0.02, compared to an eight-lake mean of 0.19, with fishing pressure accounting for the difference between total and natural mortality, indicating very high fishing pressure on Fernan Lake.

Fish Harvest
Early summer fishing pressure for bass in Fernan Lake averaged 350 hrs/ha, approximately three times the pressure of four comparably-sized lakes in the Coeur d'Alene system. In both 1981 and 1982, 3,300 bass larger than 150 mm (6 in) were harvested from the Fernan Lake (Rieman, 1987). A total of 2,800 fish larger than 200 mm (8 in) were harvested in each year, and an average of 335 fish larger than 300 mm (12 in) were harvested in each year.

No creel census or other studies of fishing pressure and overall harvest have been conducted for Fernan Lake. Wild cutthroat trout, brook trout, and stocked rainbow trout are estimated to account for over 40 percent of the catch in Fernan Lake with warm-water species accounting for the rest (IDFG, 2001b).

Fernan Lake's Vulnerability to Change

Several factors contribute to the lake's apparent vulnerability to change:

- Fernan Lake is shallow and the water column is well-mixed with no indication of substantial oxygen depletion in bottom waters.

- The steep north and south shorelines of Fernan Lake and a rapid north shoreline drop-off to a 6-m (20-ft) depth are key factors in suppressing excess rooted aquatic plant development in most of the lake.

- The low mean depth renders the lake vulnerable to further eutrophication. Nutrient supply to the water column occurs from entrainment of bottom sediments and nutrients to the surface waters where higher light intensity could produce more algae growth. Any decrease in depth would enhance this process.

- The lake's moderate algae production prior to 2003 was less than could be supported by apparent loading of phosphorus, the limiting nutrient (as judged by depletion of available phosphorus in late summer).

- The extensive macrophtye beds and wetland complexes at the lake inlet are a major factor affecting nutrient loading and recycling in Fernan Lake. During spring runoff they trap much of the sediment and absorb many nutrients delivered from the watershed. During their decline and decay in late summer, they represent a substantial source of nutrient release to the lake.

- A very high flushing rate, low hydraulic retention time, and top-to-bottom availability of oxygen during most of the year are major factors suppressing the lake's relatively high phosphorus loading (although current estimates of TP loading are probably too high). Nutrient loading estimates project a higher chlorophyll *a* production than is usually realized. Present nutrient loading does not appear to be excessive for the lake to maintain mesotrophic productivity.

- The lake has low alkalinity and soft water. It is possible that carbon and or micronutrient limitation could be occurring in addition to phosphorus limitation. As such, the lake is susceptible to enhanced carbon and trace element loading from boating, shoreline development, or other water-impacting activities.

- Even with a low mean depth, the lake presently has a balanced mix of steep, rocky shorelines; significant flat-bottom areas of prime emergent and submergent aquatic plant beds near inlets that provide nutrient filtering and diverse fish habitat; aerobic benthic areas of productive ooze; and embayments with narrow rooted plant zones offering an ideal mix of fish habitat (stable rocky shoreline, plant cover for feeding and rearing, and deeper open water).

- The lake's shoreline is stable with minimal erosion. Most of the shoreline is made up of short talus slopes except at the inlet end where the shoreline is composed of a wide, dense cover of emergent plants. The plant cover provides a stable, non-eroding, non-sediment producing (and even sediment/nutrient-absorbing) buffer zone, important in maintaining a low silt level, high water clarity, and low effective nutrient loading.

- Estimates of phosphorus loading to the lake are high, but the phosphorus input/output budget available for the lake could be erroneous and may have to be re-assessed. A key issue is the determination of nutrient loading actually delivered to the lake and not just to the wetlands at the lake's inlet.

- The lake has very high use as an urban fishery with many species of fish. The fishery could be disrupted by either increased lake stratification and/or development of high densities of Eurasian watermilfoil.

Environmental Consequences

Environmental Consequences for All Build Alternatives

Table 3-7 presents characteristics of the Alternatives E, Fm, and Preferred Alternative G that have potential to affect water quality.

Table 3-7. Characteristics of Build Alternatives Potentially Affecting Water Quality

	Alt E	Alt Fm	Alt G
Segment 1			
Disturbed Area (ha)	5.4	8.0	6.5
Disturbed Area (acre)	13.3	19.8	16.1
Shoreline Lake Encroachment (m)	30	60	100
(ft)	98	197	328
Bridge Lake Encroachment (ha)	0.18	0.0	0.12
(acre)	0.41	0.0	0.27
Segment 2			
Disturbed Area (ha)	7.3	7.1	7.1
Disturbed Area (acre)	18.0	17.5	17.5
Impacted Stream Length (km)	0.90	0.90	0.90
Impacted Stream Length (mi)	0.56	0.56	0.56
Impacted Stream Area (ha)	0.63	0.63	0.64
Impacted Stream Area (acre)	1.55	1.57	1.58
Segment 1 & 2 Combined			
Volume of Cut (1000 m^3)	115	141	95
Volume of Cut (1000 cy)	151	185	124
Volume of Fill (1000 m^3)	30	104	37
Volume of Fill (1000 cy)	40	136	49
Increased Impervious Area (ha)	1.3	1.1	1.5
(acre)	3.2	2.7	3.7

Direct, Short-Term Effects

Possible short-term water quality impacts in Segment 1 under all build alternatives would include localized increases in turbidity, decreased oxygen levels, and increased sediment deposition in the vicinity of construction. Direct, short-term impacts be associated with the removal of the road and fill across Lilypad Bay. Removal of the existing road would suspend large amounts of silt in the water column in Lilypad Bay. A silt curtain would be used to trap sediment generated during demolition.

In Segment 2 all build alternatives may impact water quality in Fernan Creek through many of the same processes and pathways described for Segment 1. The main difference is that fill would be prevalent in Segment 2 whereas cuts into hillsides and sideslopes would predominate Segment 1. Fill would extend into Fernan Creek from MP 2.8 to MP 3.0 and from MP 3.6 to MP 3.9, where the creek is immediately adjacent to the existing Fernan Lake Road.

All build alternatives propose identical improvements in Segment 3. Fernan Lake Road would be resurfaced to its current width, perhaps after milling the existing road surface. Culverts would be relined rather than replaced. Because less ground disturbance is proposed than in other segments, the potential for water quality impacts is reduced in Segment 3.

Direct, Long-Term Effects

All build alternatives would have long-term impacts to wetlands on the north side of the existing road at Lilypad Bay. Construction of bridge abutments and piers in Alternative E and Preferred Alternative G would have a negligible long-term impact on terrestrial invertebrates by reducing habitat. A larger impact relative to the present condition would be the loss of hard substrate for benthic macroinvertebrates on the roadway fill that would be removed under all build alternatives.

Removal of the existing road between MP 2.0 and MP 2.1 (whether or not a bridge is constructed) would remove some valuable, diverse underwater invertebrate structure provided by the rock fill. The substrate in Lilypad Bay is fine-grained mud, which has low diversity of macroinvertebrates living on it. This hard substrate is a valuable contribution to community diversity. On the other hand, water quality would be aided by improved water circulation in the shallower portions of Lilypad Bay. It is likely, therefore, that there would be a net improvement to invertebrate diversity and density in Lilypad Bay after removal of the existing rock fill.

The bay contains floating-leaved beds of water lilies that provide spawning, rearing, and adult feeding habitat for several warm-water fish species. The permanently flooded wetland area also provides food and cover for several fish species. Existing culverts prevent fish from accessing the wetland area from the bay. All build alternative would allow fish passage to the upper end of Lilypad Bay.

Impervious road surface area would increase in Segments 1 and 2 under all build alternatives because the pavement would be wider than the existing roadway. An increase in impervious surface area can affect hydrological processes such as increasing the overland runoff rate, mean volume, and peak-flow volume, which could cause long-term impacts to streambank stability and water quality.

The proposed stormwater improvements in the build alternatives, relative to current absence of stormwater treatment along Fernan Lake Road, would likely offset any long-term impacts to water quality from increased impervious area.

Alternative G (Preferred Alternative)

Direct, Short-Term Effects

Stormwater in Segment 1 would be channeled into roadside ditches and bioswales before entering surface channels or Fernan Lake, thereby reducing the impacts to water quality by delivering higher quality surface stormwater runoff to the lake.

Lake productivity could increase during construction activities from nutrient loading of overland runoff. This would be manifested by generally undesirable impacts of more highly colored water, less water transparency, higher algae production, and less dissolved oxygen deeper in the water column. These effects are unlikely, however, with reasonable mitigation measures during construction.

Direct, short-term impacts to water quality in Segment 1 would occur in the Lilypad Bay area of Fernan Lake during removal of the existing roadway and fill and construction of the proposed bridge.

Direct, short-term impacts to fisheries, wetlands, and water resources would occur because of road cuts and fills and construction of a curved bridge across Lilypad Bay in Segment 1. Blasting of slopes to widen the road in Segment 2 could impact westslope cutthroat trout and torrent sculpin if present during such activity.

Direct, Long-Term Effects

In the long term, lake algae productivity and trophic status could show slight declines relative to the No Action Alternative as a result of decreased nutrient loading from the improved road.

Long-term effects of Preferred Alternative G on salmonids would be slight but significantly positive by either keeping trophic status at its present level or by causing a decline.

Direct impacts to fish habitat in Fernan Creek above the lake (Segment 2) would occur as a result of filling into Fernan Creek between MP 2.3 and MP 3.0 and between MP 3.6 and MP 3.9. These impacts should be mitigated in the long term by construction of a meandering stream channel away from the road. Nevertheless, short-term impacts would occur.

Under Preferred Alternative G, shadow from the new bridge deck would also reduce the growth of wetland vegetation and change species composition in the immediate area.

Indirect and Cumulative Effects

Because the project would consist of widening an existing road, it would not open new areas to development or other activities around the lake. Cumulative impacts in the project vicinity are related primarily to unscheduled, future timber harvesting in the IPNF and construction, development, and timber harvesting on private land. Fernan Lake would potentially be adversely affected by these activities, but they could occur without the proposed improvements associated with this project.

Alternative Fm

Direct, Short-Term Effects

Construction under Alternative Fm would potentially have less impact on water resources in Segment 1 than under other build alternatives. The roadway would be re-routed upslope of the existing road and away from the lake from MP 1.1 to MP 2.1, reducing shoreline disturbance by half. If the existing roadway were removed from the lakefront between MP 1.1 and MP 2.0 and the shoreline were revegetated, the effect would be beneficial.

Direct short-term impacts to water quality in Segment 1 would occur at Lilypad Bay during removal of the existing roadway and fill. However, realignment of the road away from the lake would allow complete restoration of the shallow water habitat in the bay.

Short-term impacts to the lake's algae productivity and trophic status would be negligible in terms of both sediment and nutrient delivery.

Direct, Long-Term Effects

Lake algae productivity and trophic status could decline relative to the No Action Alternative. Stormwater would be channeled into roadside ditches and bioswales before entering surface channels or the lake, thereby reducing impacts to water quality by delivering higher quality surface stormwater runoff to the lake. The proposed roadside drainage and culvert design in Segments 1 and 2 should provide long-term improvement to water quality relative to the No Action Alternative, creating improved habitat conditions for salmonids. At the same time, warm- and cool-water fish (bass, crappie, perch, catfish, pike, and sunfish) may show slight declines with a lower trophic status. Depending on the species of concern, the improvements or declines would be slight and likely offset by continued development in the Fernan Creek watershed. However, realignment of the road away from the lake would allow complete restoration of the shallow water habitat in the bay.

Indirect and Cumulative Effects

Alternatives Fm would allow access to an area that currently does not have direct access to a paved, rural collector road, possibly resulting in residential development in the realignment area (MP 1.1 to MP 2.1). Other cumulative impacts in the project vicinity are related primarily to future timber harvesting activities in the IPNF and construction, development, and timber harvesting on private land. The Fernan Creek watershed would potentially be affected by these cumulative impacts, but they would occur with or without proposed road improvements.

Alternative E

Direct, Short-Term Effects

Alternative E is most like Preferred Alternative G in expected water quality impacts to the lake and creek. Because Alternative E builds a bridge where the original one once crossed Lilypad Bay, there is more in-lake construction and thus more potential for lake water quality impacts than with Preferred Alternative G. Also the existing road would not isolate bridge construction from the rest of the lake, as it would in Preferred Alternative G. Finally because the new bridge would be built where the original bridge was located, there is a possibility that old bridge timbers treated with preservatives like creosote would be unburied during construction of Alternative E.

Stormwater would be channeled into roadside ditches and bioswales before entering surface channels or Fernan Lake, thereby reducing the impacts to water quality by delivering higher quality surface stormwater runoff to the lake.

Direct, Long-Term Effects
In the long term, lake algae productivity and trophic status would show slight declines relative to the No Action Alternative as a result of decreased nutrient loading from the improved road.

Long-term effects of Alternative E on salmonids would be slight but significantly positive by either keeping trophic status at its present level or by causing a decline.

Indirect and Cumulative Effects
Because the project would consist of widening an existing road, it would not open new areas to development or other activities around the lake. Cumulative impacts in the project vicinity are related primarily to unscheduled, future timber harvesting in the IPNF and construction, development, and timber harvesting on private land. Fernan Lake would potentially be adversely affected by these activities, but they could occur without the proposed improvements associated with this project.

No Action Alternative
The existing alignment would be retained under the No Action Alternative. No road widening, bridge replacement, stream alteration, improved culverts, improved stormwater design, signage, or guardrail installation would occur. Routine maintenance activities would persist, and the existing road would be kept intact.

The No Action Alternative would allow continued use of the existing roadway adjacent to water systems where untreated road runoff would continue to impact water quality, wetlands, and aquatic communities. Because the build alternatives would incorporate improved stormwater drainages and improved culverts, the probability of long-term impacts from sediment delivery is higher under the No Action Alternative.

Impacts that would occur under the No Action Alternative include continued sediment inputs into the creeks from unfiltered stormwater. There would be no impacts to wetlands from any bridge or culvert construction and no impacts to the creek due to road realignment. Therefore, the No Action Alternative would have no short-term adverse impacts to fish and fish habitat but would continue to promote long-term degradation to water quality and fish habitat in the absence of better stormwater and sediment management.

The No Action Alternative would not result in adverse impacts from road construction and stream alteration. The roadway, fill, and silted-in culvert at Lilypad Bay would continue to obstruct the natural function of this area. Lake water quality and associated fish habitat would likely continue to suffer slow deterioration under this alternative, increasing sediment and overland runoff to the lake. The deterioration would likely be exacerbated by continuing impacts from timber harvesting and road use.

Mitigation

All build alternatives include recommended mitigation measures designed to reduce short-term construction impacts and long-term, cumulative impacts to water quality, aquatic habitat, and fish species in Fernan Lake and Creek.

1. All monitoring data for Fernan Lake Road stormwater runoff through existing or replaced culverts and from construction sites should be made available to water quality studies of the lake, creek, or watershed by agencies or organizations. If a bathymetric map of Fernan Lake is not produced as part of the Fernan Lake Watershed Management Plan, one should be prepared for the north shore and Lilypad Bay before construction to provide a baseline for assessing project effects on lake morphology.

2. An erosion control plan should include BMPs during construction, and new stormwater design would minimize short- and long-term sedimentation impacts on water quality. BMPs, as described in the Standard Specifications for the Construction of Roads and Bridges on Federal Highway Projects (FHWA, 1996), should be implemented during construction. BMPs include erosion and sedimentation control measures, pollution control measures, stormwater management measures, spill prevention control and countermeasures, and construction waste handling procedures. The BMPs described in the Federal Highway Runoff Manual that are applicable to project conditions during construction should be employed. Erosion control measures, such as the use of straw bales, silt fences, detention ponds, infiltration trenches and basins, sand filters, grassed swales, filter strips, porous pavement, and constructed wetlands should be used to prevent erosion if spoil piles are located near water features. Appropriate de-watering ponds should be provided below all spoil deposits.

3. A monitoring plan for stormwater collection and control should be prepared for IDEQ, addressing contaminants including sediment, metals, biochemical oxygen demand (BOD), organic nitrogen, and total phosphorus. Materials (either temporary or permanent) resulting from the excavation should be stored outside of water features and outside the 100-year floodplain.

4. The Coeur d’Alene River Ranger District of IPNF and IDFG should be notified prior to construction in sensitive areas (e.g., wetlands and creeks). Excavation and fill in water features should not occur when fish (westslope cutthroat trout) are spawning or eggs incubating in gravels (from April 1 to July 30).

5. At least 15 days prior to beginning pile driving, excavation, boring, and filling or any work within the ordinary high water line of the lake, the contractor should submit a Spoil and Wastewater Containment Plan for approval by the IDEQ, COE, and IDFG. The plan would detail how existing road and fill would be removed from the lake and where the material would be disposed. The plan should also detail how the proposed realigned channel would be constructed and how and where wastewater from the site would be treated.

6. Work should be accomplished according to plans developed by FHWA and appropriate permits, and approved by IDFG and IDEQ. A copy of these plans should be available on-site during construction.

7. Removal of existing roadway should be accomplished so that material does not enter the water. Every effort should be made to minimize the chances of increased sedimentation to Fernan Lake and Creek. Sediment fencing should be placed between near-lake construction activities and the edge of Fernan Lake. Material should be removed from the roadway fill in Lilypad Bay, for example, in a manner that minimizes sediment production and is acceptable under appropriate regulatory permits. Surface-to-bottom, in-water silt curtains should be used around all in-water activities that disturb the lake bottom and/or shore.

8. If demolition of the existing road is to include blasting, a mitigation plan to significantly reduce or eliminate impacts to fish resources should be submitted during the design phase of the project to IDFG for approval prior to any blasting. The plan should include timing restrictions to avoid spawning season, measures to remove and/or scare fish from the site, micro-second timing delays in blasting, and damage assessment procedures to monitor impacts to fisheries.

9. Necessary tree removal within the ROW and subsequent hauling should not occur during the wet season. Log landing areas should be sited away from creeks and streamside management units, and receive adequate erosion control. Sites should be approved by the IPNF. Trees along the lake that must be removed should be placed in the lake for fish habitat.

10. Improved stormwater management should be implemented under any build alternative. Stormwater drainage ditches should be located along the entire length of the north side of the road and on both sides of the road where topography permits. Dependent on getting a maintenance agreement with the appropriate party, numerous small stormwater detention-ponding basins should be located adjacent to the road (upslope side) to allow road runoff to settle before entering stream channels or the lake. Stormwater ditches should be provided on the south side of the road where possible. Where such placement was not possible, runoff from the road would sheet flow across a vegetated water quality filter shoulder to the lake or stream.

11. To avert slumping possibilities, road drainage should not be concentrated in unstable areas.

12. Wastewater from project activities and water removed from within the work area during construction should be routed to stormwater detention ponds to allow sufficient removal of fine sediment and other contaminants and to meet Kootenai County Stormwater Standards prior to being discharged to stream channels or the lake.

13. Under Preferred Alternative G, the new bridge upstream of the existing roadway and fill should be built before the existing road is removed so that the existing road would trap most of the sediment created during construction. During removal of the section of road across Lilypad Bay and construction of new water crossings, a silt curtain should be used in the lake to trap sediment generated during demolition.

14. The proposed bridge and culverts should be designed to pass the 100-year peak flow requirement and to take into account the debris likely to be encountered. Abutments, piers, pilings, sills, approach fills, etc., should not constrict flow or cause any appreciable increase (not to exceed 6 cm [0.2 ft]) in backwater elevation (calculated at the 100-year flood) or channel-wide scour, and should be aligned to cause the least effect on water features.

15. Where aggregate or earth-type material is used for paving or accumulates on the bridge, curbs should be installed and maintained to prevent the loss of this material into the water features. Bridge approach material should be structurally stable and composed of material that, if carried into the water, would not be detrimental to fish. Where possible, rock and large woody debris (timber) from road widening should be used to construct in-stream improvements.

16. Concrete structures should be sufficiently cured prior to contact with water to avoid leaching. Fresh concrete should not be allowed to come into contact with surface waters.

17. Where culverts are to be replaced, work should be limited to the low-flow season (summer, fall, and early winter). Exact timing is determined by water flow rather than date. In-channel work should be planned to exclude times when critical flow is exceeded. In-stream work should not occur during critical fish windows (April 1 to July 31). Gabions should be used directly below culvert outlets draining into water features. Planted vegetation or jute netting should be used on the side slopes on both sides of the road adjacent to culvert outlets to control erosion. Silt fences should be placed adjacent to all water features (riparian, wetland, lake) and during culvert replacement activities to intercept sediments during construction.

18. The potential for construction-related toxic pollution accidents should be controlled by requiring that all equipment be maintained and refueled on impervious surfaces where potential spills and stormwater runoff can be contained and kept out of the 100-year floodplain. A toxic spill response plan should be designed in order to contain any spills that occur.

19. Equipment used for this project should be free of external petroleum-based products while working around the lake. Equipment should be checked daily for leaks and any necessary repairs completed prior to commencing work activities along or above the river. No storage of fuel, petroleum-based products, or deleterious materials should be allowed on temporary work platforms over the lake. Equipment should be stationed on the existing roadway above the ordinary high water line or on the deck of a temporary or permanent bridge structure above the water but in an area where spills could be contained.

20. Water, not oil, should be used during construction to control dust. Water from the lake or municipal sources should be used to meet construction needs. Water should not be drawn from Fernan Creek.

21. Stabilization of road slopes through hydro-seeding should aid control of road surface drainage. Bank sloping should be accomplished in a manner that avoids release of overburden material into the water.

22. Sidecast material, cleared vegetation and debris should be properly disposed of according to state and local agency requirements. Disposal of sidecast material should be avoided in wetlands, surface channels, and the lake.

23. Where riprap materials are necessary for structure protection, angular rock should be installed to withstand the 100-year peak flow. Only clean, inert material should be allowed to contact the water. No earth fill cofferdams should be allowed.

24. Alteration or disturbance of banks and bank vegetation should be limited to that necessary to construct the project.

25. At project completion, all disturbed areas should be protected from erosion using vegetation or other means. The road banks should be revegetated with native or other approved woody and herbaceous species.

26. Because of the potential for impacts during construction, mitigation should include erosion control observation. Duties of the erosion control observer should include daily physical monitoring of all sedimentation control structures and downstream conditions within the project area. The observer, to be identified during the final design and permitting process, should assist the contractor in implementing stream and wetland mitigation plan specifications. The observer should report to the construction inspector, freeing the inspector from the monitoring duties. Erosion control measures should be implemented if work is incomplete at the end of the dry season. The observer should also be the liaison regarding fisheries issues to the county, IDFG, COE, FWS and others concerned with stream and wetland mitigation plan implementation and job performance.

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Agencies and Individuals

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3.4 WETLANDS

National Wetlands Inventory

This section describes the wetlands identified on the National Wetlands Inventory (NWI) map (FWS, 1987) within Segments 1 and 2 of the project vicinity. Segment 3 was field-verified during the wetland delineation, and no wetland areas were identified.

NWI maps serve as a preliminary research tool for wetland delineations. As prepared by the U.S. Fish and Wildlife Service (FWS) from the U.S. Geological Survey (USGS) topographic maps and aerial photographs, NWI wetland boundaries may not be accurate and must be field-verified.

Fernan Lake is categorized as “waters of the U.S.” by the COE and is classified on the NWI map as L1OWH (lacustrine, limnetic, open water, permanently flooded). Eight additional wetland classifications occur in the project vicinity (Figure 3-6). Fernan Creek is classified as R3OWH (riverine, upper perennial, open water, permanently flood).

Hydric Soils

A review of the *Soil Survey of Kootenai County Area, Idaho* (SCS, 1981) showed that six soil series underlie the project area in Segment 1 and 2 (Figure 3-7). Soils in Segment 3 have not been mapped by the Soil Conservation Service (SCS). The soils in Segments 1 and 2 are McCrosket-Ardenvoir (20 to 35 percent slopes), McCrosket-Ardenvoir (35 to 65 percent slopes), Cougarbay silt loam, Pywell muck, Ramsdell silt loam, and McCrosket-Tekoa association (35 to 40 percent slopes).

Three of the soils (Cougarbay silt loam, Pywell muck, and Ramsdell silt loam) are listed on the *Kootenai County Hydric Soils List* (SCS, 1994). The soil most commonly mapped in the existing right-of-way (ROW) on both sides of the road from MP 2.35 to the IPNF boundary at MP 5.0 consists of Ramsdell silt loam. This soil represents the majority of the soil profile along the project route. Characteristics of the soils in Segments 1 and 2 are listed and described for delineated wetlands in later sections.

Figure 3-6.. NWI Wetlands in Segments 1 and 2

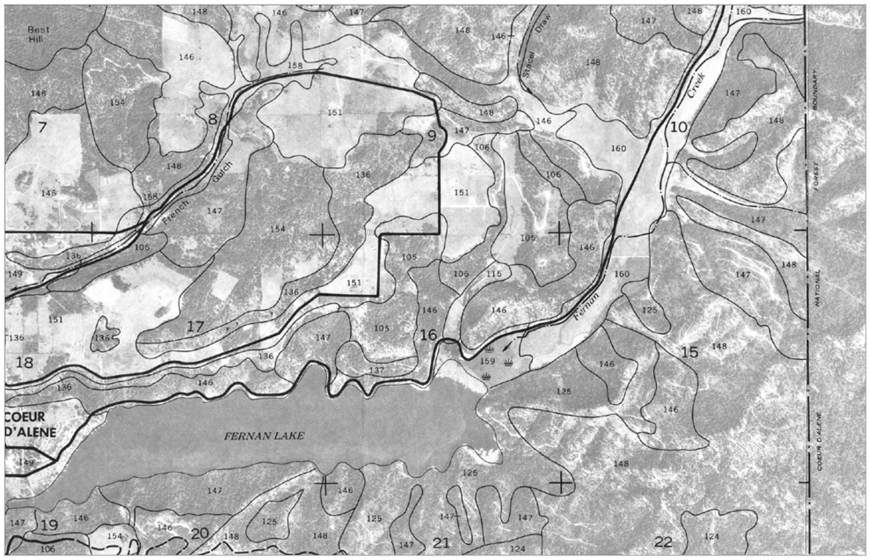

Figure 3-7. Soils in Segments 1 and 2.

Hydrology

Fernan Creek and Fernan Lake are the major hydrological features in the vicinity. The wetlands in Segment 1 are located to the north of Lilypad Bay and the road fill that crosses it. Two intermittent streams and seepage from the south side of the existing road provide hydrology to this area.

Wetlands in Segment 2 are associated with Fernan Creek. Fernan Creek and runoff from the east hillside provide hydrology for the wetland areas on the east side of the project corridor. Runoff from perennial and intermittent draws on the west side of the road and groundwater seepage from Fernan Creek provide hydrology to the wet areas on the west side of the project corridor.

Fernan Creek and its tributaries have been channeled, ditched, and diverted for agricultural ponds and farming in several locations in the project area.

Observations concerning existing wetland hydrology along Fernan Lake Road include:

- Fernan Lake is located at the toe of the slope on the south side of the existing Fernan Lake Road from the beginning of the project to MP 2.2.

- From MP 2.05 to MP 2.10, a ponded wetland area exists on the north side of the road.

- From MP 2.2 to MP 2.35, Fernan Lake transitions from shallow, open water, to a wetland area containing emergent and shrub vegetation with pockets of standing water. There are several braided meandering channels of the creek in this area, ranging across the full width of the valley.

Fernan Lake transitions from shallow, open water to emergent wetlands at the start of Segment 2.

- From MP 2.35 to MP 2.6, the creek channel is more than 150 m (500 ft) from the road. There is also a man-made channel (ditch) paralleling the road about 1.5 m (5 ft) from the edge of pavement. A wetland meadow exists between the two channels.

- Between MP 2.6 and MP 2.8, the main channel meanders back toward the road and parallels the road at a distance of 15 to 30 m (50 to 100 ft). The second, man-made channel continues to follow the road closely about 1.5 m (5 ft) from the edge of pavement. A wet meadow is located between the man-made channel and beyond the main channel of Fernan Creek.

- From MP 2.8 to MP 2.95, the main Fernan Creek splits and a portion of the channel moves to the base of the hillside and a portion connects with the man-made channel adjacent to the road. A wet meadow is located between the man-made channel and the main channel of Fernan Creek.

- From MP 2.95 to MP 3.45, water from the main channel of Fernan Creek (which is dry during part of the year) is diverted into man-made agricultural ponds approximately 120 m (400 ft) from the road. There is a still a man-made channel approximately 1.5 m (5 ft) from the edge of pavement. A wet meadow exists between the man-made channel and the agricultural ponds.

- From MP 3.45 to MP 3.6, the man-made channel immediately east of the road transitions to a roadside ditch with wetland vegetation. The main creek channel approaches the road, moving from 120 m (400 ft) to about 60 m (200 ft) from the road, and is dry during part of the year. The wet meadow ends at MP 3.52. The hydrology in this area has been altered by past and ongoing adjacent land uses, including the construction of livestock ponds, which are fed by the creek. Flows are seasonal due to the alteration of the streambed, which has broken through the clay layer allowing subsurface flows during low flow periods (summer months).

- From MP 3.6 to MP 3.9, Fernan Creek meanders closer to the road. The channel is deeply incised and there are no associated wetlands. Flows are seasonal in Fernan Creek in this area. The topography rises sharply on the west side of the road from the toe of slope.

- At MP 3.9, concrete slabs have been placed to redirect the creek channel to the east, away from the residences.

- Between MP 3.9 and MP 4.2, Fernan Creek flows behind residences, approximately 90 m (300 ft) east of the road. The creek begins to resurface in this area and flows year-round.

- From MP 4.2 to MP 4.8, the creek flows through a topographically low, wet area with pockets of standing water. There are several natural springs, which provide hydrology to the wetland area and creek.

Fernan Creek has been altered and redirected in several places in Segment 2 (MP 3.9).

- At MP 4.8, the creek has been altered by agricultural practices, and several man-made agricultural ponds have been constructed in this area.

- From MP 4.8 to MP 5.1 north of the residences, the stream bed is dry during part of the year. The creek is located between about 60 m (200 ft) to 23 m (75 ft) from the road.

- From MP 5.1 to MP 5.3, the creek resurfaces and moves farther east, approximately 61 m (200 ft) from the eastern side of the road, toward the mountains.

- From MP 5.3 to Fernan Saddle, the topography rises to an elevation of 1,238 m (4,061 ft) at Fernan Saddle. Eleven ephemeral and two intermittent draws cross under the road. The ephemeral draws are located at approximately MP 6.0 (Smith Gulch); MP 6.9 (Jungle Gulch); and MP 7.2, MP 8.2, MP 8.5, MP 8.8, MP 8.9, MP 9.3, MP 9.6, and MP 9.8, which are all unnamed drainages. Intermittent drainages are located at MP 7.1 (State Creek) and MP 10.3 (Fernan Creek). The road reaches Fernan Saddle at MP 10.7.

Jurisdictional Wetlands

Based on the presence of hydrophytic vegetation, hydric soils, and positive indicators of wetland hydrology, in addition to Lilypad Bay and Fernan Lake, seven jurisdictional wetlands (Wetlands A–H) are present. Wetland locations closely resemble the wetlands identified on the NWI maps, but boundaries were field-verified during the wetland delineation.

Fernan Lake
The deep-water portion of Fernan Lake is adjacent to Fernan Lake Road from the beginning of the project to approximately MP 2.2 and on the south side of the road. Fernan Lake is classified as "Waters of the United States" by the COE and as L1OWH (lacustrine, limnetic, open water, and permanently flooded) on the NWI maps (FWS, 1987).

Lilypad Bay
Lilypad Bay extends from approximately MP 1.95 to MP 2.15. This area is permanently flooded and vegetated predominantly with American water lily (*Nymphaea odorata*) and yellow pond-lily (*Nuphar polysepalum*).

The two seasonal drainages flowing from north to south toward Fernan Lake had free flow to the lake prior to the construction of the road. A 0.6-m (2-ft) culvert beneath the road was intended to provide a hydrologic link between the lake and the drainages. The culvert is clearly silted in and does not permit the free flow of water. During field visits in September 2002, there was a noticeably higher water elevation on the upstream side of the road.

Some buffer wetland trees and shrubs grow on the north side of the road, but the dominant vegetation is emergent. The soil on the north side of the road at Lilypad Bay is mapped as Cougarbay silt loam, according to the *Soil Survey of Kootenai County Area, Idaho* (SCS, 1981). The area located on the south side of the road at Lilypad Bay is a shallow portion of Fernan Lake. The soil in this area is classified as a Pywell muck (SCS, 1981).

Wetland A
Wetland A is a forested, scrub-shrub, emergent wetland in Segment 2 on the west side of the road at the toe of the hillslope from approximately MP 2.85 to MP 3.05. The portion of the wetland within the study corridor is approximately 0.35 ha (0.9 ac) in area. Hydrology apparently comes from two unnamed drainages on the west side of the road and groundwater from Fernan Creek lying on the east side of the road. In the southern portion of the wetland, a culvert carries water under the road from the west into Wetland C and Fernan Creek. The wetland is a topographical depression that maintains pockets of standing water at the south end and is saturated long enough during the growing season to sustain wetland characteristics.

Figure 3-8. Delineated Wetlands in Segments 1 and 2

Wetland vegetation at the south end consists primarily of willow (*Salix* spp.), red-osier dogwood (*Cornus stolonifera*), Douglas hawthorn (*Crataegus douglasii*), Douglas spirea (*Spiraea douglassi*), cattails (*Typha latifolia*), reed canarygrass (*Phalaris arundinacea*), creeping buttercup (*Ranunculus repens*), climbing nightshade (*Solanun dulcamara*), stinging nettles (*Urtica dioica*), tall managrass (*Glyceria elata*), small water forget-me-not (*Myosotis laxa*), quackgrass (*Agropyron repens*) and redtop bentgrass (*Agrostis alba*).


Wetland A is a forested, scrub-shrub, emergent wetland in Segment 7.

To the north, the wetland makes a transition into a field dominated by reed canarygrass to the north with a buffer of black cottonwood (*Populus balsamifera*), willow, and Douglas hawthorn. A portion of the field is considered wetland because it meets the three parameters of a wetland (hydric soils, hydrophytic vegetation, and hydrology).

Soil throughout Wetland A is mapped as Ramsdell silt loam throughout Wetland A, according to the *Soil Survey of Kootenai County Area, Idaho* (SCS, 1981). The soil profiles in Wetland A consist of greenish-black (10Y 2.5/1), black (10YR 2/1), and black (2.5 Y 2/00), all considered hydric soils.

Wetland B

Wetland B is a forested, scrub-shrub, emergent wetland in Segment 2 at the toe of slope, on the west side of the road from approximately MP 3.2 to MP 3.45. Within the study corridor, the wetland covers 0.17 ha (0.4 ac). Hydrology is apparently supplied via groundwater from Stacel Draw in the southern portion of the wetland and on the west side of the road. A culvert in the southern portion of the wetland conveys water north and south under a driveway, but there is no culvert under Fernan Lake Road to Fernan Creek.

The wetland is a topographical depression that is saturated to the surface in the southern portion. It supports vegetation such as Douglas hawthorn, willow, serviceberry (*Amelanchier alnifolia*), creeping buttercup, cow parsnip (*Heracleum lanatum*), field horsetail (*Equisetum arvense*), stinging nettles, and small-flowered bedstraw (*Galium trifidum*).

The wetland transitions into a non-jurisdictional roadside wetland ditch approximately 1.5 m (5 ft) wide farther north, which contains cattails, small-flowered forget-me-not, reed canarygrass, and slenderbeak sedge (*Carex athrostachya*). Ditches constructed in upland areas are considered non-jurisdictional and are not included in the wetland area totals. An upland, mowed field lying west of the non-jurisdictional ditch area contains pockets of hydric soils, but it has been planted with ryegrass (*Lolium perenne*).

Soil is mapped as Ramsdell silt loam within the project corridor and McCrosket-Ardenvoir directly to the west of the wetland, according to the *Soil Survey of Kootenai*

County Area, Idaho (SCS, 1981). The soils in Wetland B typically showed soil profiles of dark brown (10YR 3/2) with distinct mottling and dark grayish-brown (10YR 4/2) with distinct mottling, both considered hydric soils.

Wetland C

Wetland C is an open-water, aquatic bed, forested, scrub-shrub, emergent wetland located at the toe of the road fill slope on the east side of the road, from approximately MP 2.2 to MP 3.6. Within the study corridor, the wetland is approximately 11.4 ha (28.0 ac) in size, but it typically extends well beyond the study corridor.

Wetland C has water year-round and is just east of Fernan Lake Road.

Fernan Creek supplies the hydrology for this wetland. It has two channels in this area, one that is approximately 1.2 m (4 ft) from the east side of the road and another that is approximately 61 m (200 ft) east of the east side of the road. It appears that the streambed adjacent to the road was created or moved to this location, while the more easterly creek channel has a more natural appearance.

Wetland F is located on the western side the road from MP 2.65 to MP 2.75. However, Wetland C and F are not connected. Wetland F receives the majority of its hydrology from the hillslope to the west. Wetland C maintains an open-water component in both channels of Fernan Creek and a wet meadow component to the east of the channelized Fernan Creek adjacent to the road.

Wetland C extends for the width of the valley beyond the study corridor from MP 2.2 to approximately MP 3.1. From MP 3.0 to MP 3.6, the wetland narrows, but still extends beyond the study corridor.

The wet meadow portion of the wetland contains wetland herbs such as meadow foxtail (*Alopecurus pratensis*), slenderbeak sedge, sawbeak sedge (*C. stipata*), needle spikerush (*Eleocharis acicularis*), reed canarygrass, creeping buttercup, small-fruited bulrush (*Scirpus microcarpus*), giant burreed (*Sparganium eurycarpum*), and marsh speedwell (*Veronica scutellata*). The open-water portion of the wetland (the channel of Fernan Creek adjacent to the road) is surrounded by a riparian buffer of scrub-shrub and herb vegetation such as mountain alder (*Alnus incana*), cascara (*Rhamnus purshiana*), Douglas hawthorne, Douglas spirea, Nootka rose (*Rosa nutkana*), different leaved water-starwort (*Callitriche heterophylla*), floating leaf pondweed (*Potamogeton natans*), common bladderwort (*Utricularia vulgaris*), quackgrass, meadow foxtail, redtop bentgrass, and cattails.

The soil in Wetland C is mapped as Ramsdell silt loam according to the Soil Survey of Kootenai County Area, Idaho (SCS, 1981). Field investigations showed soil profiles of black (10YR 2/1), dark gray (10YR 3/1), light gray (2.5Y 7/1), light grayish brown (10R 6/2) with distinct mottling, dark brown (10YR 3/3) with distinct mottling, dark gray

(10YR 4/1), dark brown (10YR 3/2) with distinct mottling, dark grayish-brown (10YR 4/2) with distinct mottling, and dark grayish-brown (2.5 Y 4/2) with mottling, which are all considered hydric soils.

Wetland D/E

Wetlands D and E are discussed as one wetland because they are connected by a riparian area that lies outside the study corridor. Wetland D/E is forested, scrub-shrub, emergent wetlands on the east side of the Fernan Lake Road. Wetland D extends from MP 4.2 to MP 4.3, and Wetland E from MP 4.4 to MP 4.8 at the toe of the slope of Fernan Lake Road. Wetland D/E is approximately 8.0 ha (20 ac) in size, of which 5.0 ha (12.4 ac) lie within the study corridor.

Hydrology for the wetland is apparently supplied by Fernan Creek, located about 23 m (75 ft) from the east road edge, from an unnamed drainage on the west side of the road that crosses through a culvert to join the creek, and from underground springs. The wetland is a topographical depression that receives groundwater from all of these sources and contains several small pockets of water throughout.

Wetland D/E supports a variety of vegetation, including western red cedar (*Thuja plicata*), Douglas-fir (*Pseudotsuga menziesii*), black cottonwood, Douglas spirea, thimbleberry (*Rubus parviflorus*), pacific ninebark (*Physocarpos capitatus*), red-osier dogwood, western water hemlock (*Cicuta douglasii*), water horsetail (*E. fluviatile*), small flowering wood rush (*Luzula parviflora*), small-flowered forget-me-not, creeping buttercup, water parsley (*Oenanthe samentosa*), and cattail.

Soil is mapped as Ramsdell silt loam within the study corridor according to the *Soil Survey of Kootenai County Area, Idaho* (SCS, 1981). The soil profiles included dark gray (10YR 3/1), dark grayish brown (10YR 4/2) with distinct mottling, light brownish gray (2.5Y 6/2), dark gray (2.5Y 4/1), and black (2.5Y 2/0), all considered hydric soils.

Wetland F

Wetland F is a forested, scrub-shrub, emergent wetland on the west side of the road at the toe of slope from MP 2.65 to MP 2.75. The wetland is a topographical depression approximately 0.4 ha (1.0 ac) within the study corridor that receives runoff from the mountains to the west of the wetland and groundwater from Fernan Creek and Wetland C, located across the road. Standing water was noted in the center of the wetland during field investigations. Vegetation primarily consists of Douglas hawthorn, willow, Douglas spirea, reed canarygrass, and sedge species.

Access to the wetland was denied by the property owner during the 2000 field investigation, therefore no plots were established for data collection. However, photographs, soil survey, and visual observations were used to determine the characteristics of the wetland. The wetland boundaries are defined by the road is on the east side and an upland slope located to the west of the wetland.

Wetland G

Wetland G is scrub-shrub, emergent wetland on the west side of the road at the toe of slope from MP 4.25 to MP 4.3. Approximately 0.03 ha (0.08 ac) is within the study corridor. The wetland is a topographical depression that appears to receive groundwater from an unnamed tributary to Fernan Creek on the west side of the road. Soils are saturated long enough during the growing season to exhibit hydric characteristics.

Vegetation consists primarily of Douglas hawthorn, thimbleberry, wild strawberry (*Fragaria virginiana*), water horsetail, and stinging nettles. Soil is mapped as Ramsdell silt loam, according to the *Soil Survey of Kootenai County Area, Idaho* (SCS, 1981). Field investigations identified soil profiles of dark grayish-brown (10YR 4/2) with distinct mottling and gray (10YR 5/1), both considered hydric soils.

Wetland H

Wetland H is an open-water, emergent, scrub-shrub, forested wetland on the north side of the road at the toe of slope at Lilypad Bay from MP 2.03 to MP 2.08 at Lilypad Bay. It is approximately 2.7 ha (6.7 ac) in size and is entirely within the study corridor. The wetland is a topographical depression that receives surface water from two unnamed creeks to the north and apparent subsurface water flow from Fernan Lake (seepage through the road fill), since the culvert under the road is blocked.

Wetland H is north of the existing road across the upper portion of Lilypad Bay.

Standing water exists in the southern portion of the wetland where aquatic vegetation such as yellow pond lily, western water hemlock, cattails, water millfoil (*Myriophyllum spicatum*), large duckweed (*Spiradela polyrhiza*), and small water forget-me-not occur. Riparian trees and scrub-shrub vegetation such as willow, red-osier dogwood, Doulgas spirea, Douglas hawthorn and snowberry (*Symphoricarpos alba*) surround the open-water portion of the wetland. The wetland field north of the open water contains vegetation such as Douglas hawthorn, silky lupine (*Lupinus micranthus*), creeping buttercup, small fruited bullrush, Canada thistle (*Cirsium arvense*), spotted knapweed (*Centaurea maculosa*), slough sedge (*C. obnupta*), western St. John's wort (*Hypericum perforatum*), curly dock (*Rumex crispus*), red top, field mint (*Mentha arvensis*), meadow foxtail, snowberry, reed canarygrass, and red clover (*Trifolium partense*).

Soil in the southern portion of the wetland is inundated year-round and soil in the northern portion of the wetland adjacent to the open water is saturated long enough during the growing season to exhibit hydric characteristics. The soil in Wetland H is mapped as Cougarbay silt loam within the project corridor according to the *Soil Survey of Kootenai County Area, Idaho* (SCS, 1981). The soil profiles in Wetland H consisted of dark gray (10YR 4/1) and dark brown (10YR 3/2) with mottles, which are both considered hydric soils.

Functional Assessment

Functional assessment categories (WDOE, 1991) range from I (very high quality) to IV (very low quality). Wetlands A, B, C, D/E, F, and H were rated as Category II and Wetland G was rated as Category III. There are no high-quality natural heritage wetlands along Fernan Lake Road due to the presence of Fernan Lake Road and other structures; and agricultural uses that could bring contaminants into the system. The study corridor does not contain irreplaceable ecological functions (such as peat wetland).

Wetland A

Wetland A presents an emergent, scrub-shrub and forested class with a moderate diversity of plant species. Interspersion between wetland classes is moderate. There are at least three standing dead trees per acre and at least one of these trees is greater than 25 cm (10 in) in diameter, but the trees are less than 15 m (50 ft) tall.

Wetland A is not connected via surface water to a stream but likely receives its hydrology from two unnamed intermittent drainages and groundwater from Fernan Creek. The wetland is buffered by Fernan Lake Road, a pasture, and an open hillside or forest. On the west side of Wetland A across Fernan Lake Road is the riparian corridor of Wetland C. Wetland A is categorized as Category II.

Wetland B

Wetland B contains an emergent, scrub-shrub, forested class with a low diversity of plant species. Only a small part of the southern portion of Wetland B contains scrub-shrub and forested class. The interspersion between the wetland classes is moderate. There are no standing dead trees or snags, but there are telephone poles and fence posts that can be used as bird perches.

Wetland B is not connected via surface water to a stream but likely receives hydrology from Stacel Draw groundwater. Stacel Draw is an intermittent drainage that flows into the southern portion of the wetland at certain times of the year. Wetland B is buffered by Fernan Lake Road, a driveway, and a mowed lawn area. Wetland B is categorized as Category II.

Wetland C

Wetland C, which extends to the east and south outside the study corridor, contains an open-water, aquatic bed, emergent, scrub-shrub and forested class with a high diversity of plant species and a high level of interspersion between the wetland classes. Wetland C contains healthy populations of the scrub-shrub and forested classes, but the trees are less than 15 m (50 ft) tall. There is evidence of beaver use in the Fernan Creek channel adjacent to the road. There are at least three dead trees or snags and several telephone poles in which birds can perch or nest.

Fernan Creek runs through Wetland C, which is connected to Fernan Lake at the south end of the wetland. Both Fernan Creek and Lake contain several different native and introduced fish species. Wetland C is buffered by Fernan Lake Road, a pasture, and forest. Wetland C is directly across the road from Wetlands A, B, and F. Wetland C is categorized as Category II.

Wetlands D and E

Wetlands D and E are discussed as one wetland because they are connected by a riparian area that lies outside the study corridor. Wetland D/E contains an emergent, scrub-shrub and forested class with a moderate diversity of plant species. Interspersion between the wetland classes is moderate. There are at least three standing dead trees per acre and at least one of these trees is greater than 25 cm (10 in) in diameter.

Wetland D/E is hydrologically connected to Fernan Creek, which flows on the west border of the wetland, and is buffered by Fernan Lake Road, a pasture, and a forested area. Wetland D/E is categorized as Category II.

Wetland F

Wetland F presents an emergent, scrub-shrub and forested class with a moderate diversity of plant species. The interspersion between the wetland classes is moderate. There are no standing dead trees or snags, but there are telephone poles and utility wires that can be used as bird perches.

Wetland F is not connected via surface water to a stream but apparently receives water as sheet flow from the adjacent hillside and as groundwater from Fernan Creek. Wetland F is buffered by Fernan Lake Road and a hillside. It is across the road from Wetland C. Wetland F is categorized as Category II.

Wetland G

Wetland G contains an emergent and scrub-shrub class with a low diversity of plant species. Only a small part of the southern portion of Wetland G contains the scrub-shrub and forested class. The interspersion between the wetland classes is low. There are no standing dead trees or snags, but there are telephone poles and utility wires that can be used as bird perches.

Wetland G is not connected to a stream but receives water from an unnamed draw that flows into the southern portion of the wetland at certain times of the year. Wetland G is buffered by Fernan Lake Road and by a forested area and is directly across the road from Wetland D. Wetland G is categorized as Category III.

Wetland H

Wetland H consists of an open-water, aquatic bed, emergent, scrub-shrub and forested class with a high diversity of plant species and a high level of interspersion between the wetland classes. Wetland H contains healthy populations of the scrub-shrub and forested classes, but the trees are less than 15 m (50 ft) tall. There is evidence of beaver use in the creek channel adjacent to the road. One dead ponderosa pine was observed as well as telephone wires on which birds can perch or nest.

Wetland H was previously hydrologically connected to Fernan Lake through a culvert beneath Fernan Lake Road, but the culvert appears to be silted in and does not allow free flow of water. Some hydrologic connection apparently still exists in the form of subsurface seepage. Although Fernan Lake contains several different native and introduced fish species, the unnamed seasonal tributaries that flow into Wetland H from the north do not contain fish populations. Wetland H is buffered by Fernan Lake Road, a lawn, and a narrow forested area. Wetland H is directly across the road from Fernan Lake. Wetland H is categorized as Category II.

Environmental Consequences

All build alternatives would result in impacts to waters of U.S., including wetlands. Table 3-8 summarizes these impacts and assumes that Lilypad Bay south of the existing road crossing is water of the U.S., whereas the portion north of the road is wetland.

Table 3-8. Impacts to Waters of the U.S. and Wetlands

	Alternative E		Alternative Fm		Alternative G*	
	ha	ac	ha	ac	ha	ac
Waters						
Fernan Lake	0.18	0.45	0.03	0.07	0.02	0.06
Fernan Creek	0.63	1.60	0.63	1.60	0.64	1.60
Total Water	0.81	2.05	0.66	1.67	0.66	1.66
Wetland						
A	0.062	0.153	0.037	0.090	0.035	0.086
B	0.103	0.255	0.056	0.138	0.122	0.301
C	1.140	2.818	0.760	1.877	0.880	2.176
D	0.342	0.844	0.425	1.050	0.558	1.379
E	0.336	0.829	0.281	0.695	0.318	0.785
F	0.003	0.007	0.003	0.008	0.006	0.015
G	0.007	0.016	0.002	0.004	0.004	0.011
H	--	--	0.242	0.597	0.030	0.074
Total Wetlands	1.993	4.922	1.806	4.459	1.953	4.827

* Preferred Alternative

Mitigation

To obtain a permit allowing the alteration of wetlands, it must be demonstrated that steps have been taken to:

- avoid the impact altogether;
- minimize impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts;
- rectify the impact by repairing, rehabilitating, or restoring the affected environment;
- reduce or eliminate the impact over time by preservation and maintenance operations during the life of the action;
- compensate for the impact by replacing, enhancing, or providing substitute resources or environments; and
- monitor the impact and the compensation project and taking appropriate corrective measures.

All wetland impacts that cannot be avoided during final design if a build alternative is selected will be mitigated by replacing the lost wetland volumes. Impacts to wetlands must be mitigated per stipulations from the COE and IDWR, respectively, for the Section 404 permit and the Stream Alteration Agreement. Specific mitigation would be developed during the permit review process. MP 3.6 to MP 3.9 where no wetlands currently exist may be a suitable location of wetland creation. However, because most of the land in the immediate area of impact is privately owned, mitigation design would depend on impacts to adjacent landowners and availability of land.

Potential mitigation concepts include:

- Wetlands could be mitigated using a combination of wetland enhancement and replacement. Mitigation could include restoration of all affected wetlands by replanting with native trees and shrubs. Mitigation could also include some in-kind wetland creation. Wetland could be created adjacent to affected wetlands.
- New vegetation plantings for riparian and wetland mitigation could be managed as specified by the 404 permit.
- The top 15 cm (6 in) of soil in wetland areas to be excavated or filled should be removed and stockpiled prior to disturbance for later revegetation on the project.

- The build alternatives impact Fernan Creek, and mitigation may include realignment in Segment 2 so that the new channel would incorporate several curves and bends; as well as the addition of large woody debris structures and native riparian plantings at a ratio to be determined by permit requirements. This type of design would increase overall channel length and moderate flows. Design guidelines include minimizing channel straightening and reshaping, promoting bank stability by installing riparian plantings, employing bank stabilization techniques, and emulating the morphology of natural channels.

- Removal of road fill at Lilypad Bay.

Specific wetland mitigation measures include:

1. If rerouting of the construction ROW around the wetlands is not feasible, the top 15 cm (6 in) of soil would be removed and stockpiled prior to trenching and for no more than 5 days.

2. Under Alternatives E, Fm and G, the construction ROW would be narrowed as much as possible to minimize disturbance to wetland areas.

3. Organic soils from affected wetlands would be stockpiled and used in wetland mitigation areas.

4. Minimize impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts.

5. Rectify the impact by repairing, rehabilitating, or restoring the affected environment.

6. Reduce or eliminate the impact over time by preservation and maintenance operations during the life of the action.

7. Compensate for the impact by replacing, enhancing, or providing substitute resources or environments.

8. Monitor the impact and the compensation project and taking appropriate corrective measures.

References

FWS (U.S. Fish and Wildlife Service). 1987. National Wetlands Inventory Map. Fernan Lake Quadrangle.

SCS (U.S. Department of Agriculture Soil Conservation Service). 1981. *Soil Survey of Kootenai County Area, Idaho.*

______. 1994. *Kootenai County Comprehensive Hydric Soils List*.

WDOE (Washington Department of Ecology). 1991. *Washington State Wetlands Rating System for Eastern Washington*. October. #91-58.

3.5 CULTURAL RESOURCES

Historical properties are the locations of tangible, physical remains of past human activity. The ages of these resources in the region range from thousands of years to at least 50 years old. The properties themselves may be archaeological sites, buildings, structures, districts, objects, and more recently, landscapes. Prehistoric or Native American historic properties may include archaeological sites that represent residential areas, campsites, lithic scatters, resource processing locations, petroglyphs, pictographs, hunting blinds, stone cairns, or burial locations. Also important are places or resources that have traditional cultural importance to contemporary American Indians now represented by tribal governments. Particularly important are cemeteries and isolated interments, sacred landforms, ceremonial sites, rock art, cairns, certain animal and plant resources, and locations prominent in mythology and tribal history.

Other cultural remains represent the activities of Euroamericans in the region for the last two centuries. These remains include buildings, structures, and sites associated with agriculture and settlement (e.g., homesteads, irrigation systems, fences, corrals), mining (e.g., tunnels, tailings, mills, camps), logging (e.g., mills, spur railroads, camps, equipment), the development of regional transportation (e.g., roads, railroads, associated construction camps, maintenance facilities), and federal administration (e.g. U.S. Forest Service roads, trails, ranger stations, lookouts, experimental stations, other facilities).

The following sections briefly summarize pre-history of the area and Fernan Lake Road. More details may be found in the Cultural Resources report (NWAA, 2003).

Prehistory

Very little investigation of prehistory has been undertaken in the project vicinity. The earliest inhabitants likely entered the region at least 9,000 years ago in pursuit of large game, like bison and possibly extinct species like mammoth. Permanent settlement and subsistence continued to rely on local resources, but as population increased and the forest canopy closed as a result of climate change and became less productive for game, settlement became increasingly focused on river and lakeside adaptations. In the salmon-free region of north Idaho people began to harvest and preserve plant resources, like camas and wapato. Trade and travel were also undertaken to salmon-rich areas to the west and the bison filled Great Plains to the east.

Contact with Euroamerican culture had profound effects on patterns of Native American life in the region. The introduction of the horse to the Northwest in the eighteenth century changed traditional subsistence by allowing easier transport of heavier, bulkier loads over longer distances. A second major Euroamerican introduction that affected Native American life ways, possibly as early as the sixteenth century, was disease. Native groups continued to be decimated by diseases like measles, smallpox, and tuberculosis throughout the nineteenth century and into the twentieth (Boyd, 1985).

Ethnography/Ethnohistory

The project is in the traditional territory of the Coeur d'Alene Indians who occupied an area of at least 4,000,000 acres centered on the lake of the same name and its major tributaries the Coeur d'Alene, St. Joe, and St. Maries rivers, as well as the Spokane River.

The Coeur d'Alene had three larger social groupings. The first of these included families that wintered near the present city of Coeur d'Alene. Settlements of the other two bands were along the St. Joe and Coeur d'Alene rivers (Frey, 2001:42).

In 1842, Jesuit missionaries met with the Coeur d'Alene and subsequently founded a mission at Mission Point on the south end of Lake Coeur d'Alene. The Jesuit priests tried to change the subsistence pursuits of the Coeur d'Alene from fishing, gathering, and hunting to farming. The Coeur d'Alene Reservation was established in 1873 and in 1906 land allotment took place in advance of opening the reservation to non-tribal settlement in 1909.

History

Fur traders of the Canadian North West Company were the first Euroamericans to enter the region in 1807 after Lewis and Clark traveled along the Clearwater River in 1804-1806. Gold discoveries in the 1850s and 1860s began rushes through the region to British Columbia and Montana. Idaho territory was created in 1863 and enough permanent residents lived in the area by 1864 to form Kootenai County, which encompassed much of the Idaho Panhandle. The Mullan Road, which passed through the Coeur d'Alene Valley just south of Fernan Lake was completed by the military in 1862. In 1878 Fort Coeur d'Alene, later called Fort Sherman, was established, beginning the city of Coeur d'Alene. Permanent regional settlement, however, awaited the arrival of the railroad in 1886.

The Fernan Lake Road

As the town expanded, settlers claimed land in the surrounding rural areas for farms and homes. One was John Fernan, a Civil War veteran who stayed in the Army until his discharge at Fort Coeur d'Alene in 1880. He and his wife Mary decided to stay in the area and by 1883 they were living east of town next to a small lake that bore their name. Fernan received a final patent on his homestead in October 1894.

A road reached Fernan Lake at least by the end of 1893 (Figure 3-9). A General Land Office map drawn in March 1893 shows a road branching off the Mullan Road to curve in to the outlet of the lake, then continuing a short way northeast to Fernan's house. Fernan Road (#110) was surveyed and declared a county road in November 1893.

Before the Coeur d'Alene Highway District or Kootenai County constructed a planned Fernan Lake Highway, the United States plunged into the Great Depression. The Forest Service utilized two types of federal public works programs to carry out construction of the Fernan Lake Road between 1934 and 1941. Both enrollees in the Civilian Conservation Corps (CCC) and crews from the Works Progress Administration (WPA) worked on the road.

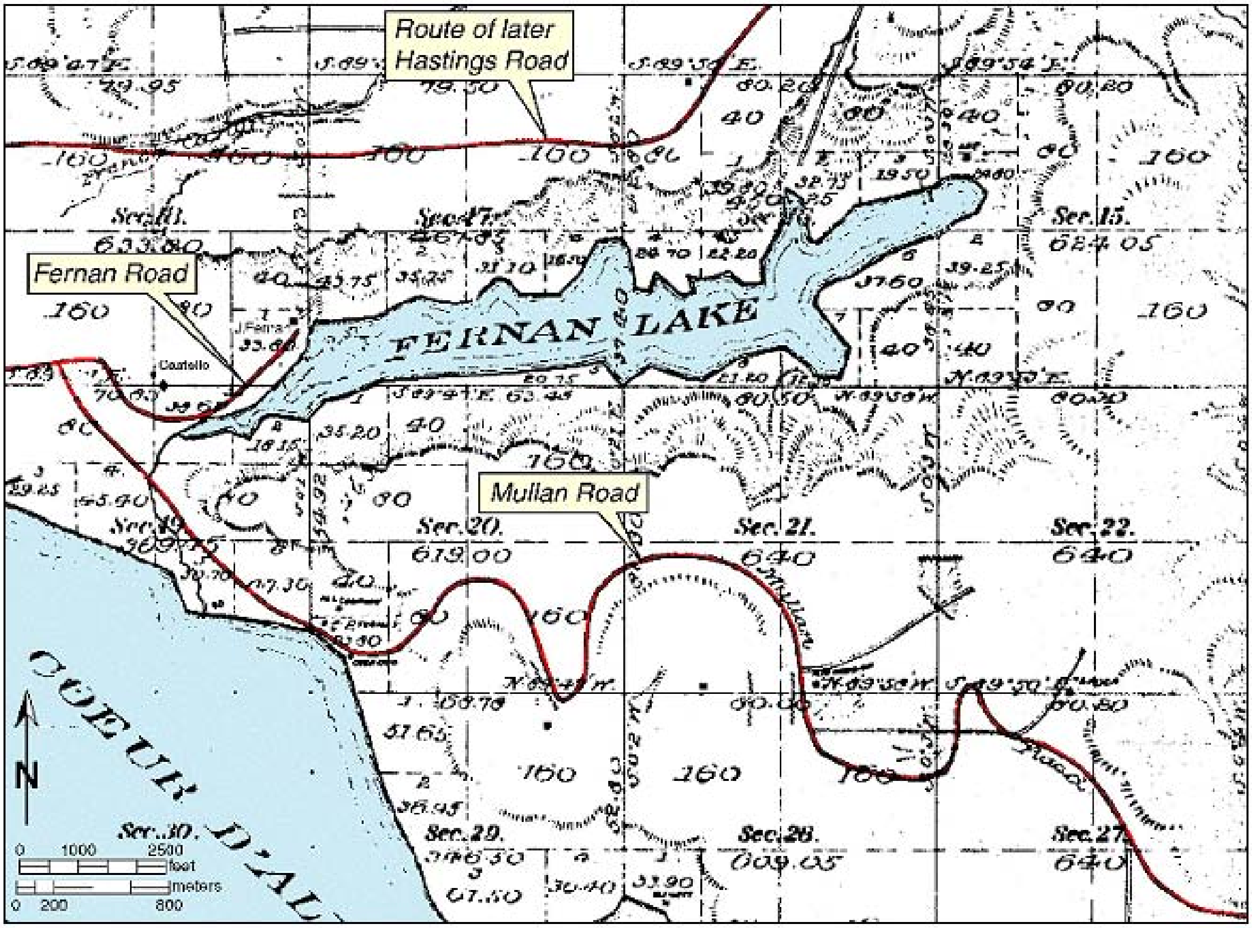

Figure 3-9. GLO Plat of Fernan Lake Vicinity (1893).

Applicable Laws and Regulations

The federal government has developed and supports a national policy of protection and management of historic properties through regulations and executive orders. The project's proposal has been identified as an undertaking because it follows federal easements, requires federal permits and approvals, and will receive federal funding.

If they are determined eligible under 36 CFR 800-60.4, historic properties are one of several resource categories protected under Section 4(f) of the Department of Transportation Act of 1966, as amended. Section 4(f) requires that the Secretary of Transportation not approve federally assisted transportation projects that may adversely affect protected resources unless there is (1) no feasible and prudent alternative, and (2) all possible planning has been done to minimize harm. Additional discussion is found in Chapter 5 of this EIS.

Recorded Sites

Only a single historic site has been previously recorded along the Fernan Lake Road. It was recorded during a survey of 50 acres at the confluence of Fernan Creek and Dry Gulch for a proposed shooting range (Sims, 1981). The site was the location of a homestead in 1913. Through the 1940s and 1950s several sawmills were built on the property, each succeeding one that had burned. Remaining features include an earthen dam, can dump, truck bed, and a post and rail feature. A survey of the Fernan Lake Road (Sims, 1997) identified no additional sites. No sign of features associated with the homestead and mill location are adjacent to the road in the project study corridor.

A wooden bridge crossed Lilypad Bay from the 1930s to the 1960s.

Fernan Lake Road was constructed by the Forest Service using labor from the CCC and ERA from 1934 to 1941. Fifteen features were noted during field investigating for this EIS along the length of the road from Fernan Village to Fernan Saddle including 12 culverts, eight of which have associated retaining walls, matching bridge abutments, and two independent retaining walls. The culverts include large timber pass-throughs, or cattle passes, and corrugated metal pipe. The retaining walls surround culverts and support nearby slopes. The bridge abutments are from the wooden bridge that originally crossed Lilypad Bay near MP 2.0.

Kelly Homestead site includes four buildings and a rock wall next to a retaining wall of the Fernan Lake Road. The site is at the confluence of Rondo Creek and Fernan Creek on the east side of the road. William Kelly settled here in 1892, filed for a homestead in 1893, and gained ownership of 160 acres in 1901. Based on preliminary designs this site would not be affected by any of the build alternatives.

Evaluation of the Fernan Lake Road

The Fernan Lake Road

Integrity. Segments 1 and 2 of the Fernan Lake Road retain integrity of location, design, setting, workmanship, materials, feeling, and association. These segments have undergone maintenance, repairs, and improvements, such as paving, removal of some rock at the four points along the lake shore, and minor re-alignment around Lilypad bay. This process is part of the natural evolution of secondary road and as such includes acceptable modifications. The basic route and design of the road and its relationship to its setting along the lake remain unaltered. Segments 1 and 2 retain the original narrow width and curving alignment. The stonework constructed by the CCC and blasted rock faces continue to provide strong indications of the workmanship required in the construction, and a strong sense of feeling and association with the

Old retaining walls along the road are examples of stonework by the Civilian Conservation Corps.

New Deal era, public works projects, and the Civilian Conservation Corps remains. The setting and feeling of the road is perhaps more like its original with re-growth of forest following fires and logging.

Segment 3 has been reconstructed and although it retains the original alignment, the bed has been changed substantially by raising it as shown by the discovery of old culverts far beneath new ballast.

NRHP Eligibility. The Fernan Lake Road has been evaluated under Criterion a established by the Advisory Council on Historic Preservation (36 CFR 60.4) for evaluating sites. Under this criterion, a historic site must be associated with an event, usually determined through historic research. *Eligible* events may include specific events marking an important moment in American history, a series of related events, or an historical trend.

Segments 1 and 2 of the Fernan Lake Road are recommended for inclusion in the National Register under Criterion a because of the road's role in the transportation history of the state of Idaho and its association with the CCC. As the preceding historical context discussion has illustrated, road building in Idaho was a slow and laborious process because of the difficult terrain and *the* lack of funding for expensive construction projects. Although major highways in the state, were in place by the 1920s, secondary road construction lagged. The advent of the Great Depression worsened the economic situation throughout Idaho, but federally subsidized projects designed to put people back to work began to bring results in the state by 1934. Two major work programs, CCC and WPA, provided crews during construction in the 1930s, while the Forest Service provided the leadership and technical designs for the work.

Locally, the road is also significant for its association with the 20th century development of the Fernan Lake vicinity, providing the first access to the length of Lake Fernan, to Huckleberry Mountain and its fire lookout, to Deception Creek and the Experimental Forest, and to valuable new timberlands. This new road stimulated the regional economy by increasing access to agricultural lands, timber resources, mining claims, and recreational opportunities. Its importance is shown by its eventual completion by the Forest Service as a Class 4, or heavy-duty, road.

Owing to extensive modification that affects the integrity of design, setting, workmanship, materials, feeling, and association of Segment 3, this portion of the Fernan Lake Road is not recommended as eligible to the NRHP.

Environmental Consequences

The presence of historic properties within the project area triggers the necessity of assessing potential adverse effects per 36 CFR 800.4(2). The assessment of adverse effects is applied under the guidance of 36 CFR 800.5(a). The effect is adverse when the integrity of the property's location, design, setting, materials, workmanship, feeling, or association is diminished [36 CFR 800.5(a)(1)]. The criteria of adverse [36 CFR

800.5(a)(1)] includes physical destruction or alteration and isolation of the property's environment as well as transfer, lease or sale, of the property.

Direct Impacts

Current designs to bring the road up to modern safety and traffic handling standards as presented in Alternatives E, Fm, and Preferred Alternative G will alter or eliminate the historic features in Segments 1 and 2 as well as affect the vertical rock faces and sinuous alignment of the NRHP-eligible portion of Fernan Lake Road. Alternative E and Preferred Alternative G appear to minimize changes to the alignment. Alternative E would also restore the original alignment across Lilypad Bay.

Alternative E: This alternative would follow the existing alignment with the exception of construction of a bridge at the location of the road's earlier bridge across Lilypad Bay. The alignment would maintain the edge of pavement of the lake side of the road in order to minimize effects to the Lake. The sinuosity of the road and steep bounding walls would be retained, although widening and construction of retaining walls will be necessary in places. The new bridge would restore a portion of the original alignment. The preliminary design of this build alternative appears to be most like the original and retains partial integrity of location, design, setting, feeling, and association, although original culverts and retaining walls would be removed.

Alternative Fm: The roadway in this alternative would diverge from the original alignment between MP 1.1 and 2.1. The Segment 1 alignment close to the lake with rock faces and steep slopes to the north is one of its defining features. The abandoned portion of Segment 1 and its features would be destroyed.

Preferred Alternative G: This design is similar to Alternative E with retained sinuosity and horizontal alignment relative to the existing edge of the road. It replaces the roadway across Lilypad Bay with a curved bridge to improve water flow. The current bridge is in the existing road alignment as modified in the 1960s.

No Action Alternative: The existing grade and features of the Fernan Lake Road would continue their natural deterioration.

Indirect Impacts

No indirect impacts are foreseen for any alternative.

Cumulative Impacts

Rural roads like Fernan Lake Road, constructed by the Depression-era public works programs, are probably relatively common in the West but only became eligible for consideration of historical significance in the 1990s when they reached the age of 50. To date, few roads like these in the state of Idaho have been evaluated and many may already have been extensively altered or completely destroyed.

Recommended Mitigation Measures

Adverse effects could be avoided by the No Action Alternative. For the other alternatives, an exception to a finding of adverse effect can be achieved by documenting the historical values of the Fernan Lake Road, Segments 1 and 2 before destruction [36 CFR 800.6]. Maintenance of any of the distinguishing elements of the road including rock work, sinuosity, narrowness, and steep flanking walls in Segments 1 and 2 would help to minimize adverse effects, however, these very elements may be at odds with safety concerns.

Mitigation measures must be developed in consultation with the SHPO and should include creation of a photographic record of features of the road that will be destroyed and of the portions of the original alignment that will be removed or abandoned. An interpretive sign or display could also be developed in partnership with the IPNF to explain the history of the road and highlight the features of its construction that are distinctive.

Additional environmental commitments include:

1. During construction, measures to protect remaining structures and minimize site disturbance adjacent to the historic site would be used.

2. If cultural materials are discovered during excavation, construction activities will halt until qualified historians and/or archaeologists have evaluated the materials and site.

References

Frey, Rodney in collaboration with The Schi̲tsu'umsh. 2001. *Landscape Traveled by Coyote and Crane; The World of the Schi̲tsu'umsh (Coeur d'Alene Indians).* University of Washington Press, Seattle.

Sims, Cort. 1981. Cultural Resource Inventory of the Northwest Firearm Training Center. Report on file, Idaho State Historic Preservation Office, Boise.

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3.6 FISH, WILDLIFE, AND VEGETATION

Applicable Laws, Regulations, and Plans

Federal Laws, Regulations, Permits, and Enforcement

Threatened, Endangered, and Formally Proposed species as managed under authority of the Endangered Species Act (ESA) and the National Forest Management Act (NFMA) for national forest lands are addressed in this chapter. The ESA requires federal agencies to ensure that all actions they "authorize, fund, or carry out" are not likely to jeopardize the continued existence of any Threatened, Endangered, or Proposed species. Agencies are further required to develop and carry out conservation programs for these species.

This chapter also discusses species classified as FS Sensitive or FS Species of Concern in the FS Region 1 where IPNF is located. Classification of a species as Sensitive is based on "significant current or predicted downward trends" in either (1) population numbers or density, or (2) habitat capable of supporting viable populations and therefore affecting species distribution (FS, 1991a). Although the NFMA and Forest Service Manual impose no strict requirements, management of Sensitive species is typically conducted so as to avoid effects that would require a species to be listed under the ESA. Anticipated conservation strategies for each species are expected to give direction in maintaining habitat diversity and managing population viability as required by the NFMA (1976).

IPNF Forest Plan

The *IPNF Forest Plan* (FS, 1987) requires management and construction of roads in a manner consistent with the protection and management of other resources including Threatened and Endangered fish, wildlife, and plant species. The Forest Plan also provides standards and guidelines for roads in Riparian Habitat Conservation Areas (RHCA) with non-priority watersheds like Fernan Creek (Jerome 2002). Although Fernan Creek below MP 5.0 is outside the IPNF boundary and therefore not subject to categorization by the FS, this EIS includes the entire watershed, including the lake, as a non-priority RHCA.

The proposed project falls primarily within two management areas identified by the Forest Plan:

- MA-4 (timber production with big-game winter range). MA-4 lands comprise 99,108 hectares (ha) (244,900 acres [ac]) covered under the Forest Plan. The project area is within MA-4 from MP 5.0 to MP 7.0. The primary goal for management of these lands is to provide winter forage to support existing and projected big-game populations by scheduling timber harvests and providing permanent forage areas.

- MA-9 (land unsuited for timber production). MA-9 lands comprise 102,548 ha (253,400 ac) covered under the Forest Plan. The project area is within MA-9 from MP 7.0 to the end of the project area at MP 10.7. These lands are managed with the goal of maintaining and protecting existing improvements and resource production.

Inland Native Fish Strategy (INFS)

Under the authority of 36CFR219,10(f), the Inland Native Fish Strategy (INFS) amended Forest Plans for 22 National Forests, including the IPNF. The INFS contains standards and guidelines for ensuring that federal actions will protect populations and habitat of resident native fish. Goals of the INFS are to maintain or restore water quality, riparian areas, and associated fish habitats in order to provide healthy, functioning watersheds.

FS Noxious Weed Integrated Management Program

The Coeur d'Alene Ranger District implemented a noxious-weed integrated management program in 2000. Weed infestations begin when activities, such as road construction, fire, all-terrain vehicle (ATV) use, etc., disturb the natural environment. Weed seeds can be brought in by livestock, logging trucks, recreational vehicles, birds, and, in fact, all visitors to the forest area. Once a weed seed has fallen on appropriate soil, an infestation can begin.

State of Idaho Listed Species

Regulations relating to Threatened, Endangered, and Sensitive species are covered primarily by federal law. The Idaho Conservation Data Center (ICDC) (formerly the Idaho Natural Heritage Program) has worked with the FS to compile applicable federal listings. The ICDC is the central repository for information related to the state's rare plant and animal populations. The State of Idaho currently classifies many of the listed species as FS Sensitive species or Species of Special Interest or Concern but has no laws regulating habitat protection.

Local Laws, Regulations, Permits, and Enforcement

Kootenai County Noxious Weeds Ordinance #168, administered by the County Office of Parks and Waterways, declares that noxious weeds must be controlled within the county. This ordinance applies to Segments 1 and 2 (MP 0.0 to MP 5.0). Specific weeds identified in the ordinance include blueweed, tansy chicory, cinquefoil, thistle, and certain varieties of sage, knotweed, hogweed, bugloss, ox-eye daisy, and hydrilla.

Affected Environment

Fernan Lake Road is located within the Fernan Creek watershed of the Coeur d'Alene River Basin. The size of the watershed, shown in Figure 3-10, is approximately 4,900 ha (12,000 acres). Approximately 61 percent of the watershed is in the Coeur d'Alene River Ranger District of the IPNF, and the remainder is in private ownership.

Fernan Creek parallels Fernan Lake Road from Fernan Lake to Huckleberry Saddle, is the primary drainage path in the watershed, and is approximately 11.9 km (7.4 mi) long. Valley sideslopes are generally steep (50 to 70 percent) and vegetated predominately with conifers. Land-use activities such as timber harvesting and road building have occurred both in the IPNF and on private lands within the Fernan Creek watershed.

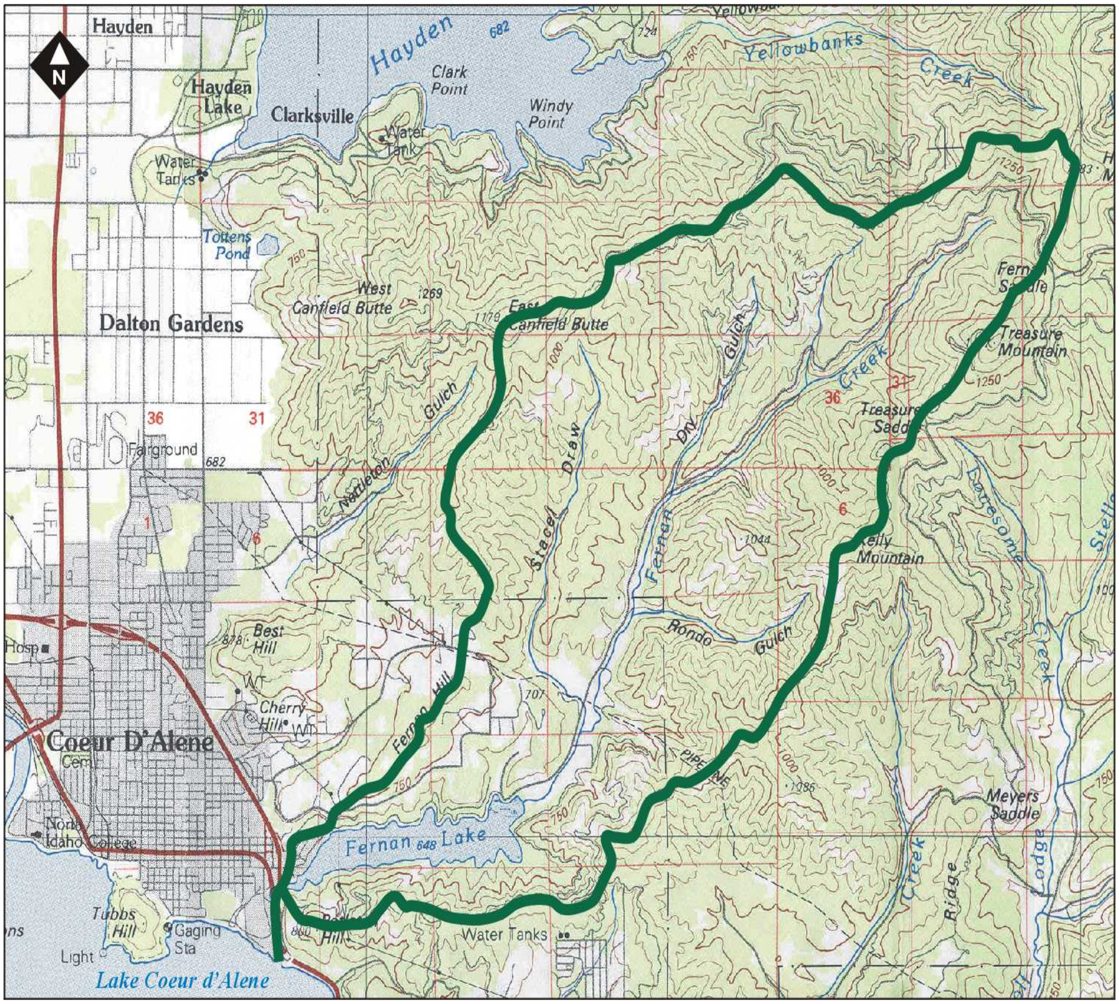

Figure 3-10. Fernan Lake Watershed

Fernan Lake has 154 ha (381 ac) of surface water and 8.7 km (5.4 mi) of shoreline with mean depth estimates ranging from 3 m (10 ft) (Mossier, 1993) to 6 m (20 ft) (DEA, 2003) and a maximum water depth of 8.5 m (28 ft) (FLWTAC, 2003). The lake is mesotrophic to late-mesotrophic. All of Fernan Lake and the lower half of Fernan Creek are surrounded by private land. Sections of the creek in its lower half are dry at the surface during part of the year due to extensive channelization and past rerouting.

Fish Habitat Conditions

IPNF considers the Fernan Creek watershed to be "not properly functioning" (FS, 1998a). A watershed system that is not properly functioning exhibits rapid adverse trends and may not fully support beneficial uses. The system may appear to be responding to its own last adjustment, rather than toward stabilizing the last disturbance. The system may be out of balance with the environment and may not be in dynamic equilibrium for several decades. Usually these types of systems are in need of large-scale restoration. However, restoration is typically not a top priority for IPNF because of limited availability of resources, uncertain technology, and a long recovery period (FS, 1999c).

Riparian areas of the Fernan Creek watershed have been destabilized by the effects of past activities and are now in various stages of recovery. The quality of fish habitat in the Fernan Creek watershed has generally been compromised by roads, residential developments, stream modifications (e.g., constriction, channelization, diversion, dams, culverts, removal of woody debris), logging, and fire suppression but is adequate to support viable populations of some cold-water biota, especially resident fish. The diverse condition of habitat components (e.g., stream temperatures, aquatic habitat diversity, cover complexity, and channel stability) in the higher watershed have enabled fish populations to persist albeit at suppressed levels (FS, 1999c). The upper reaches of Fernan Creek maintain year-round flows and have existing populations of fish species such as brook trout (*Salvelinus fontinalis*), rainbow trout (*Oncorhynchus mykiss*), torrent sculpin (*Cottus rhotheus*), westslope cutthroat trout (*Oncorhynchus clarki lewisii*), and wild cutthroat trout (*Salmo clarki*) (FS, 1999a).

Habitat Access (Physical Barriers)
Two known fish barriers are present in the Fernan Creek watershed. One is the visible, silted-in culvert at Lilypad Bay, which may prevent some fish from migrating. The other is the small dam and wooden weir on Fernan Creek outlet between the lake and Lake Coeur d'Alene. This structure prevents fish migration for at least part of the year. During dry summers there is not enough water to allow fish migration, even if the dam were absent. Conditions for this indicator are therefore assumed to be functioning at risk.

Habitat Elements
Substrate embeddedness. Data on substrate embeddedness in the project area are limited. Substrate embeddedness conditions were inferred from sedimentation information, and this indicator is assumed to be functioning at risk.

Large woody debris (LWD). Data are limited. Field visits indicate that Fernan Creek in Segment 2 is deficient in LWD, primarily in the lower section of Fernan Creek near the lake. Fernan Creek in Segment 2 has been channelized by private owners, which may have affected the presence of LWD in this section of the creek. There are few sources of LWD in the lower creek valley. The resulting lack of LWD supply has destabilized some stream reaches and contributed to declines in fish habitat. Conditions for this indicator are therefore assumed to be functioning at risk.

Pool frequency. An abundance of LWD recruitment can increase the development and maintenance of diverse habitat conditions including quality pool habitat and complex cover. Riffle habitat makes up a large percentage of the habitat in the upper Fernan Creek drainage above MP 5.0 (Lider, 2001). The absence of pocketwater habitat in Segment 3 suggests that rearing habitat has been greatly reduced and also suggests that habitat has changed from pocketwater to riffle due to bedload movement and channel aggradation. In Segment 2, the absence of LWD and channelization of the creek by private landowners have both contributed to the lack of pool habitat in this segment as well. This information indicates that the project watershed may be functioning at risk for this indicator.

Large pools. Information from IPNF indicates that while some pools are present in Fernan Creek, they are much smaller in size, and riffle habitat dominates the creek. This is the result of channel aggradation and the loss of stable pool formative features. Limited available information supports an assumption that this indicator corresponds generally to that of pool frequency and is functioning at risk.

Off-channel habitat. Overwintering is typically comprised of off-channel habitat or deeper pools that allow fish to avoid high stream flow velocities. Most side channels in the upper drainage are high-energy flow areas, indicating that the project watershed may be functioning at risk for this indicator.

Refugia. The Fernan Creek watershed is likely to provide size and connectivity to other refugia. Therefore, this indicator is assumed to be functioning appropriately.

Watershed Conditions

Road density and location. Roads that encroach on stream channels or flood-prone areas are common in the Fernan Creek watershed. Average road density in the Fernan Creek watershed is approximately 8.3 km/km^2 (1.7 to 4.7 mi/mi^2) (FS, 1999c). In Segment 2, private landowners have channelized portions of Fernan Creek so that from MP 2.2 to MP 3.0 and from MP 3.6 to MP 3.9, the creek is immediately adjacent to the road. Roads that occur in riparian areas constrict the stream, particularly during high flows, forcing large volumes of water through a smaller channel with great erosive force. Road and culvert failures along with channel pattern changes can result in undesirable long-term effects to the stream. This indicator is functioning at risk.

Disturbance history. The watershed has been disturbed by past and current logging, road building, and private landowner development. Private land owners in the lower portion of the Fernan Creek watershed have diverted and straightened the channel of Fernan Creek to accommodate grazing and agricultural practices. This indicator is functioning at risk.

Riparian conservation areas. Many riparian areas in the Fernan Creek watershed do not provide shade or woody debris recruitment and are considered non-functioning or functioning at risk as a result of timber harvesting, mining, road building, agriculture, and development. Riparian vegetation in the region was historically dominated by large conifers, which benefited fish habitat by stabilizing banks, providing shade for water temperature modification, and producing LWD for cover, sediment detention, pool formation, and nutrient inputs. However, some areas could not regenerate after logging because cold air drainage created frost pockets in valley bottoms (FS, 1991b) and small patches of open meadow developed along the lower reaches of numerous streams. Encroachment by streamside roads is the dominant feature of riparian areas in the watershed (FS, 2000). Although some riparian areas show increases in riparian cover and trees, this indicator appears to be functioning at risk.

Disturbance regime. Past alterations to the landscape from logging, road building, mining, and private development likely have reduced the resiliency of stream habitat in the watershed. According to the FS, bed load and channel aggradation are the primary factors affecting the Fernan Creek channel in Segment 3. Although the FS is decommissioning roads on a national level, in this portion of the IPNF roads are likely to stay in place or be converted to trails for all terrain vehicles (ATV) due to increasing public recreational use (FS, 1998a). Based on limited available information, this indicator appears to be functioning at risk.

Threatened, Endangered, and Sensitive Fish Species

Bull Trout (Threatened)

Bull trout (*Salvelinus confluentus*) are listed as threatened under ESA. Bull trout are also listed FS Sensitive and as a Management Indicator Species (MIS) by the FS Region 1 and are a State of Idaho Species of Concern. Bull trout have not been documented in Fernan Lake or Creek, and they are not expected to inhabit the watershed (Horner, 2002; Lider, 2000). The Fernan Creek watershed is not considered essential for the conservation of bull trout, therefore it is not within proposed bull trout critical habitat (Deeds, 2003).

Westslope Cutthroat Trout (Sensitive)

Westslope cutthroat trout are native to the Coeur d'Alene River system and are documented in the Fernan Creek watershed (FS, 1999a). Their preferred habitat is cold, clear streams that contain rocky, silt-free riffles for spawning, and slow, deep pools for feeding, resting and over-wintering.

A small population of westslope cutthroat trout utilize Fernan Creek and Fernan Lake within the project area for migration, spawning, rearing, and over-wintering (Roper, 1997). Adfluvial (migratory within fresh-water streams) fish from Fernan Lake use Fernan Creek at some life stages. Adult westslope cutthroat trout from the lake spawn in the upper reaches of Fernan Creek in April and May, then return to the lake. The fry emerge in June or July, but spend two to three years rearing in the creek before migrating to the lake to mature (FS, 1991b).

Torrent Sculpin (Sensitive)

Torrent sculpin were added to the IPNF's Sensitive species list on March 12, 1999. Typical torrent sculpin habitat is in the middle reaches of streams with swift, cool water and a stable substrate of gravel, rubble, or boulders (Brown, 1971; Wydoski and Whitney, 1979; Finger, 1982; Holton and Johnson, 1996). This species spawns in the spring (May or June) in riffles with moderate to swift flows. Females produce from 100 to 350 eggs, depending on a female's size. Food includes a variety of aquatic invertebrates, small fish, and fish eggs. Adult sculpin can reach a length of 150 mm (6 in) or more. Torrent sculpin are thought to serve as forage fish for trout and char.

Torrent sculpin may be present in the Fernan Creek watershed, in both the lake and creek, although fish surveys have not been conducted (FS, 2000).

Game Fish

Fernan Lake receives heavy angling pressure and nearly 23,000 trout per year are stocked by IDFG. Fernan Lake provides one of the finest natural urban fisheries in the state (IDFG, 2002). It is one of the few lakes statewide where easy pedestrian access is allowed.

Early summer fishing pressure for bass in Fernan Lake averaged 350 hrs/ha, (865 hrs/acre) approximately three times the pressure of four comparably-sized lakes in the

Coeur d'Alene system. In both 1981 and 1982, 3,300 bass larger than 150 mm (6 in) were harvested from the Fernan Lake (Rieman, 1987). A total of 2,800 fish larger than 200 mm (8 in) were harvested in each year, and an average of 335 fish larger than 300 mm (12 in) were harvested in each year.

Cutthroat trout, brook trout, and stocked rainbow trout are estimated to account for over 40 percent of the catch in Fernan Lake. Warm-water species including largemouth bass (*Micropterus salmoides*), black bullhead catfish (*Ameiurus melas*), channel catfish (*Ictalurus punctatus*), black crappie (*Pomoxis nigromaculatus*), yellow perch (*Perca flavescens*), pumpkinseed sunfish (*Lepomis gibbosus*) and northern pike (*Esox lucius*), accounting for the rest (IDFG, 2002).

Trout species are cool-water fish, so as surface temperatures rise they move to deeper, more protected waters. Perch species are schooling fish and can occur near docks and open areas. Pumpkinseed sunfish and black crappie live in shallows. Largemouth bass prefer heavy cover. Catfish are bottom feeders and occur at the lake bottom (IDFG, 2002).

Environmental Consequences (Fish)

Construction activities most likely to disturb fish and fish habitat include removal of the existing road fill and the one visible culvert at Lilypad Bay, blasting, bridge construction, rock fill placement in Fernan Lake, removal of riparian vegetation adjacent to Fernan Creek, and realignment of the creek in two places in Segment 2. Impacts to aquatic environments are shown for each alternative in Table 3-9. Adult migration, spawning, and rearing habitat would be affected by construction activities to varying degrees depending on habitat requirements of fish species present and the extent of mitigation incorporated in the project. Excavation of soils during construction could result in erosion of excavated or stockpiled material. Magnitude of effects is directly related to the amount of material exposed, the duration of construction, and the efficacy of mitigation measures. A temporary increase in runoff turbidity at construction sites would be anticipated. Milling old pavement in Segment 3 could also contribute to an increase in sediments in the creek and thence to the lake if precautionary measures are not taken.

Table 3-9. Impervious Surface, Impacts, and Culverts Per Build Alternative

Type of Impact	Alternative E	Alternative Fm	Alternative G*
New Impervious Paved Roadway Area (hectare)	1.3	1.1	1.5
Stream Impact (linear meters)	898	897	901
Wetland Impact (linear meters)	4,261	3,783	3,761
Stream Impact Area (sq. meters)	6,272	6,340	6,390
Wetland Impact Area (sq. meters)	19,921	18,049	19,537
Lake Shoreline Impact from bridge (linear meters)	180	--	--
Lake Shoreline Impact (linear meters)	30	60	100
Lake Shoreline Impact Area from bridge (sq. meters)	1,800	--	--
Lake Shoreline Impact Area (sq. meters)	30	278	246
Wetland Impact Area from bridge (sq. meters)	--	--	1,180
New Culvert Installations	30	33	30

* Preferred Alternative

Effects Common to the Build Alternatives

Direct, Short-Term Effects

Habitat for bull trout exists in the Fernan Creek watershed, but bull trout have not been documented in the project area. Westslope cutthroat trout have been documented in the upper reaches of Fernan Creek and use Fernan Lake as adult migration habitat. Torrent sculpin have been documented in Fernan Lake. Blasting adjacent to Fernan Lake and Creek might temporarily displace torrent sculpin and Westslope cutthroat trout.

Culverts would be replaced where they currently exist in major stream crossings at Stacel Draw (MP 3.3), Dry Gulch (MP 5.4), and State Creek (MP 7.0). Culvert lengths would be extended to accommodate the proposed road widening. Additional culverts would be installed where needed. Construction activities associated with proposed culvert replacement, new culvert placement, and road grade cuts and fills in the vicinity of water features would temporarily affect water quality through short-term increases in sedimentation and turbidity.

In all build alternatives, there is high potential for roadcut erosion and for delivery of sediment into water bodies in Segments 1 and 2, particularly in the fill-removal area of Lilypad Bay and the creek and wetland fill from Lilypad Bay to MP 3.9.

Road construction in Segment 1 would be concentrated on the northwestern side of the road and would avoid filling into the lake to the maximum feasible extent. However, in order to avoid unstable hillsides and correct unsafe road design, riprap is proposed into the lake at MP 1.05 in Alternatives E, Fm, and Preferred Alternative G. In the long term, addition of stormwater ditches would improve water quality.

Road improvement in Segment 2 would cause direct effects to water quality in Fernan Creek during construction. However, the existing road is near the creek and lake and is currently affecting water quality. The existing road does not have stormwater drainage ditches on the water side of the road. It is reasonable to assume that small spills of petroleum products, antifreeze, and other vehicle-related chemicals occur occasionally on roads in the project area, and these spills eventually wash into the lake and creek. Routine maintenance including sand and magnesium chloride placement on the road during the winter can also increase pollution and sediment loads in streams and contribute to poor water quality and reductions in suitability of fish habitat. In the build alternatives, the road would be constructed so that stormwater would drain into stormwater ditches to allow some filtration before entering the lake and creek.

Direct, Long-Term Effects

Impervious surface area in the project vicinity would be increased in all segments under the build alternatives. The amount of new impervious surface varies per Alternative (see Table 3-9). An increase in impervious surface area can affect hydrological processes by increasing runoff rate and peak flows. This could cause direct effects to streambank stability and water quality unless mitigated (for example, by adding detention facilities).

Stormwater from the new road at Lilypad Bay would flow from either side of the bridge and be collected in roadside drainage ditches and stormwater detention ponds on the northwestern side (away from the lake) before flowing through culverts and into Fernan Lake. The impervious surface from the new alignment under the build alternatives would be collected into stormwater ditches before entering the lake or creek, reducing the amount of stormwater, petroleum products, and other impurities released into the water.

In contrast, the existing road at Lilypad Bay prevents fish from feeding in the wetland area because the one visible under-road culvert linking the wetland and lake is at least partly silted in and prevents fish from passing freely under the road. Removal of the existing road between MP 2.0 and MP 2.1 and construction of a bridge in this area would provide additional aquatic invertebrate habitat. Removal of the impervious surface would benefit water quality. Effects to wetland areas would be mitigated.

Consistency with INFS

Although Fernan Creek is not a priority watershed, INFS standards and guidelines apply to National Forest system lands in all watersheds. Project alternatives are evaluated in terms of how they maintain or move riparian condition forward toward attainment of interim INFS RMOs relating to fish habitat, stream temperature, and streambank stability.

There are not enough data on streams in the Fernan Creek watershed to determine whether INFS RMOs are currently being met. However, stream channel conditions, riparian vegetation conditions, and overall fish habitat quality within the project area would be permanently affected by stream alteration in the build alternatives.

Construction activities proposed in the build alternatives may not be consistent with the goal of allowing increased carrying capacity for trout populations, or with the goal of protecting stream banks and riparian zones, unless Fernan Creek were realigned and restored to a more natural condition as is currently proposed for mitigation. INFS goals would be met, however, and creek habitat could be improved over time as a result of the channel realignment construction of meanders, revegetation, and other restoration efforts.

The No Action Alternative

Stream channel conditions, riparian vegetation conditions, and overall fish habitat quality within the project area would remain static under the No Action Alternative.

ESA Listed Wildlife Species

In 2003, the gray wolf (*Canus lupus*) (Threatened) and bald eagle (*Haliaeetus leucocephalus*) (Threatened), were identified by FWS and potentially occur in the project vicinity. The FS also identified the Canada lynx (*Lynx canadensis*) (Threatened) as potentially occurring in the project vicinity. In 2002, the FS indicated that neither the Woodland caribou (*Rangifer tarandus caribou*) (Endangered), the grizzly bear (*Ursus arctos*) (Threatened), or their habitat are present in the project area (Warden, 2002). Due to the low probability of occurrence, woodland caribou and the grizzly bear will not be analyzed further in this document. The three Threatened and Endangered wildlife species that could potentially occur in the project area are shown in Table 3-10.

Human development, habitat loss, fragmentation, and disturbances may affect Threatened and Endangered species in the project area. Forest management that has altered the amount and distribution of structural stages and roads built for development, recreation, mining, and timber management have led to displacement and increased mortality of wildlife from otherwise secure and suitable habitat. Species associated with mature or old forest structure with snags, and species sensitive to human disturbance, are likely to have been more abundant historically across the IPNF and the Fernan Creek watershed than they are now.

Table 3-10. Threatened and Endangered Wildlife Species Present or Potentially Present in the Project Area

Common (scientific) name	FWS listing	Habitat requirements	Potential habitat	Presence	Rationale
Gray wolf (Canus lupus)	Threatened	Remote areas for denning, ample prey (ungulate) population.	Yes	Low Potential	Low to moderately suitable habitat present, wide-ranging species. May use elevations below 900 km (3,000 ft) for winter range. A group of wolves was sighted near Hayden Creek in 1986. However, no recent sightings have been recorded on the Coeur d'Alene River Ranger District (Warden 2001).
Lynx (Lynx canadensis)	Threatened	Mature to early successional forest for denning and feeding. Remote areas above 1,220 m (4,000 ft) with some spruce/fir habitat and adequate snowshoe hare populations.	Limited	Low Potential	Wide ranging species, suitable habitat limited, but documented closer to Idaho/Montana border. Low potential near Fernan Lake due to disturbance from existing road. Suitable habitat may be present near Fernan Saddle.
Common (scientific) name	FWS listing	Habitat requirements	Potential habitat	Presence	Rationale
Bald eagle (Haliaeetus leucocoephalus)	Threatened	Large bodies of water with ample prey (fish, waterfowl), large trees for nesting.	Yes	Yes	Documented nest approximately 0.4-km (.25- mi) south of project area.

Gray Wolf (Threatened)

Gray wolves require a sufficient year-round prey base of ungulates (e.g., deer, elk, moose) and alternate prey; suitable and somewhat secluded denning and rendezvous sites; and sufficient space with minimal exposure to humans (FWS, 1987).

The Fernan Creek watershed is characterized as providing low- to moderate-quality wolf habitat. Most of the Fernan Creek watershed has roads with moderate levels of human disturbance. No gray wolves have been observed in the project area, and although it is unlikely that wolves use any part of the project area for denning or rendezvous sites, they may use elevations below 914 m (3,000 ft) for winter foraging (Warden, 2000).

Canada Lynx (Threatened)

Canada lynx are associated with alpine and montane boreal plant communities above 1,219 m (4,000 ft). Because they prey primarily on snowshoe hares, especially in winter, the abundance of snowshoe hares is the limiting factor for lynx habitat. Snowshoe hare availability is in turn limited by its winter habitat, characterized by an abundance of shrubs, birches, and conifer saplings. There have been no reported sightings in the Fernan Creek watershed, and the project area is not in or within 40 air k (25 air mi) of a Lynx

Analysis Unit (LAU) (Warden, 2000). The majority of the watershed occurs below 1,219 m (4,000 ft). If lynx are present in the basin, they are most likely transitory individuals.

Bald Eagle (Threatened)
In the Pacific Northwest, bald eagle nesting requirements include proximity to water with an adequate food source, large trees with sturdy branching at sufficient height for nesting, and vertical and horizontal stand heterogeneity (Grubb, 1976). Wintering activities occur from approximately October 31 to March 31 (FWS, 1996). Wintering bald eagles concentrate in areas where food is abundant and disturbance is minimal (Rodrick and Milner, 1990). Because eagles depend on dead or weakened prey, spawned salmon are often an important food source. Rivers, streams, and large lakes with spawning salmon and/or waterfowl concentrations are primary feeding areas for wintering bald eagles.

The FWS and IDFG indicate that there is not suitable bald eagle wintering habitat at Fernan Lake because the lake freezes in the winter (Harris, 2000). Potential summer roosting and perching sites exist, and bald eagles have been sighted near the lake in spring and fall (Warden, 2000). An active bald eagle nest is located approximately 0.4 km (0.25 mi) from the project area and is within line-of-sight of Fernan Lake Road. The nest is located in the forest on the southern, unroaded edge of Fernan Lake, on private land. The nesting pair have successfully fledged young each year from 1999 through 2003 (Spicer, 2003).

Environmental Consequences to ESA-Listed Wildlife

Three Threatened or Endangered wildlife species may potentially occur in the vicinity of Fernan Lake Road: gray wolf, Canada lynx, and bald eagle. The effects from the build alternatives on these species are fundamentally the same and are discussed collectively below.

Direct, Short-Term Effects
The primary effects to gray wolf, Canada lynx, and bald eagle would be associated with the actual construction of the project, including:

- temporary displacement of prey species such as migratory and resident waterfowl, and of resident wildlife including deer, squirrels, newts, salamanders, frogs, and turtles; and
- disturbance such as noise, light (for work conducted at night), loss of vegetation, construction waste and litter, and increased human activity during construction.

All alternatives would temporarily increase disturbance levels in roadside habitat due to construction. However, increased disturbance (e.g., road traffic noise) effects would be insignificant to Canada lynx and gray wolf because the existing roadway already reduces seclusion opportunities and the proposed widening would not worsen this condition. Canada lynx and gray wolf are only expected to occur within the project area on rare occasions when moving between suitable habitats or potentially during winter foraging.

An increase in traffic volume and vehicle speeds would not occur under the build alternatives because the road would remain a two-lane road with the same speed limits as currently exist. Traffic-related mortality to wildlife should not increase substantially. Therefore, the build alternatives are not expected to result in significant impacts to Canada lynx or gray wolves.

An active bald eagle nest has been documented approximately .40 km (.25 mi) from the project area. Bald eagle nesting activity typically occurs from January 1 to August 15, and loud construction noise (pile driving and blasting) during that period within 1.60 km (1 mi) of the nest could disturb nesting eagles and chicks should the nest be active during construction. Other construction-related noise could disturb nesting eagles and chicks within 0.8 km (.50 mile) of the nest. Construction-related noise could also temporarily displace the nesting eagles should they forage within .80 to 1.6 km (.50-to-1 mile) within the project area. Due to the absence of suitable bald eagle wintering habitat, impacts to wintering eagles are not expected.

The number of native terrestrial species, including waterfowl, a bald eagle prey source, could be displaced from the project vicinity during construction but are expected to return to current levels after construction. Waterfowl would likely move to a portion of the lake with lower disturbance levels. Such movement is not expected to significantly affect bald eagle foraging success during the nesting period.

Direct, Long-Term Effects

The majority of the project area is within a rural residential setting that has already been disturbed by the existing road, private road construction, timber salvage, and land modification. Some wetland and upland vegetation would be removed in Segments 1 and 2 during improvement of the road under the build alternatives.

Cumulative Effects

Widening of the existing road would not promote future construction or other activities since these activities would most likely occur without project completion. Cumulative effects would be related primarily to future construction and timber harvesting on IPNF and private lands. The Fernan Creek watershed would potentially be affected by these activities. However, the effects of the proposed road widening combined with construction on adjacent private property at current zoned densities on listed species or their habitats would be minimal. Therefore, no change in current effects on listed Threatened, wildlife species would likely occur.

The No Action Alternative

Direct, Long-Term Effects

The existing road alignment would be retained under the No Action Alternative. None of the project-related activities proposed under the build alternatives would take place. The roadway would remain as it is presently, and existing maintenance would continue. No change in current effects to Threatened wildlife species would occur under the No Action Alternative.

Under the No Action Alternative, yearly road maintenance (spot improvements in areas of failing road surfaces, signage, culvert replacement, striping, etc.), would increase because of the projected increase in traffic and because portions of the road would continue to be in poor condition. The No Action Alternative would allow continued use of the road without adequate stormwater management. An accidental leak or spill of petroleum products would be likely to affect bald eagle foraging habitat since there are insufficient drainage measures to capture spilled fluids before entering the lake and creek. Thus, the probability of habitat damage from petroleum products may be slightly greater for the No Action Alternative than for the build alternatives, which include improved stormwater management features.

Cumulative Effects

The No Action Alternative would continue to contribute incrementally to overall habitat degradation in the Fernan Creek watershed. Inadequate stormwater management would continue to allow runoff from impervious surfaces to flow directly into Fernan Creek and Lake, washing petroleum and other contaminants from the road surface into the water and degrading wetland and bald eagle foraging habitat. In addition, other development, both public (logging, other IPNF uses) and private (residential development, agriculture), would continue to occur.

FS Sensitive Wildlife Species

Sensitive species are determined by the Regional Forester of FS Region 1 (FS, 1991a) and are species for which population viability is a concern. The Forest Service manages habitat of Sensitive species to prevent further declines in populations and to prevent federal listing (FS, 1987).

Black-Backed Woodpecker

The black-backed woodpecker (*Picoides articusi*) inhabits coniferous forests with a dead or dying tree component and is known to occur in northeast Washington. Because the woodpeckers have a greater affinity for fire-killed trees, burned areas provide important habitat. Black-backed woodpeckers are cavity nesters and require snags or live trees with dead heartwood for nesting.

Black-backed woodpecker distribution in Idaho is unknown. According to FS data, suitable habitat for the black-backed woodpecker is present in the FS portion of Fernan Lake Road above MP 7.0, and the woodpeckers are considered to be potentially present.

Coeur d'Alene Salamander

Coeur d'Alene salamander (*Plethodon vandykei idahoensis*) has been documented in three major types of habitats in northern Idaho: spring seeps, waterfall spray zones, and along stream edges between 549 to 1,067 m (1,800 to 3,500 ft) elevation. Known populations have been located only at sites where the presence of fractured bedrock, combined with relatively high substrate moisture, high relative humidity, and moderate air temperatures create favorable habitat conditions.

Fernan Creek watershed contains some roadside banks and streams that may serve as potential habitat, although no individuals were found during a survey of a small portion of Fernan Lake Road conducted in 1997 (FS, 1997b). No recent surveys have been conducted, but populations could occur in roadside banks and streams from Lilypad Bay to the FS boundary at MP 5.0.

Common Loon

Common loons (*Gavia immer*) are large, heavy-bodied birds whose legs and feet are positioned far to the rear. They require lakes of at least 4 ha (10 ac) to gather enough speed to take off. Migratory loons have been sighted on Coeur d'Alene Lake and were sighted on Fernan Lake in 1998 (National Audubon Society, 1998).

Fisher

Fishers (*Martes pennanti*) typically inhabit mature/old growth forests. They utilize forest riparian habitat for travel corridors and resting sites. In north-central Idaho, grand fir and spruce forests were preferred by fishers (FS, 1999c) at elevations of approximately 914 to 1,524 m (3,000 to 5,000 ft). Fishers are considered rare throughout most of Idaho and would be rare within the Fernan Creek watershed. Fishers tend to avoid human presence and are more common where there are fewer people and less human disturbance.

The Fernan Creek watershed contains pockets of suitable habitat above MP 5.0, wherever disturbance levels are low. Vehicle and human disturbance within the project area minimize the chance of habitat use by fishers (FS, 1997b). Recent fires, beetle-caused mortality, and ice damage have also reduced the canopy closure on some suitable habitat in the Fernan Creek watershed (FS, 2000).

Flammulated Owl

Suitable flammulated owl habitat consists of mature/old-growth ponderosa pine and Douglas-fir forests above 914-m (3,000-ft) elevation, on south-facing slopes, often near small clear-cuts. The stand component includes open understories, a grass/forb component, and some large shrub vegetation. The owls depend upon naturally occurring or excavated cavities for nesting. Consequently, snags and other defective trees are an important component of their breeding habitat.

These owls are attracted to relatively open, older forests featuring ponderosa pine and Douglas-fir that are correlated with drier habitats. Reynolds and Linkhart (1992) reported that all published North American records of nesting except one came from forests in which ponderosa pine was at least present, if not dominant.

Surveys were conducted by the Coeur d'Alene River Ranger District in 1998, 1999, and 2000, and no owls were documented (Warden, 2001). Patches of mature forest habitat are present above 914 m (3,000 ft) in the Fernan Creek watershed, primarily in the forested portions of the IPNF and approximately 3.2 km (2 mi) from Fernan Lake Road. The project area above MP 5.0 may provide foraging habitat for owls from the mature forest (Warden, 2002).

Harlequin Duck

Harlequin ducks (*Histrionicus histrionicus*) winter in marine habitats and migrate inland to breed. Fernan Creek is not a large, fast-flowing stream with mid-stream loafing sites; therefore, harlequin duck habitat is not expected in the Fernan Creek watershed.

Northern Goshawk

Northern goshawks (*Accipiter gentilis*) favor open country such as shrub-steppe habitat for wintering, but may reside in heavily forested areas throughout the year. Goshawks typically nest in mature/old growth ponderosa pine and Douglas-fir forest, but may also nest in deciduous trees.

Some successional stage forests and wetland areas in the vicinity of Fernan Lake Road may be used for forage habitat, but because there are no old growth stands within 3.2 km (2 mi) of the road and the amount of understory in successional stands in the area is too dense, no nesting northern goshawks are likely to occur within the Fernan Creek watershed (Warden, 2000).

Northern Leopard Frog

Northern leopard frogs (*Rana pipiens*) occupy marshes, wet meadows, riparian areas, and moist, open woodlands, and apparently require a moderately high groundcover for concealment. Because the species attaches its eggs to aquatic vegetation, it prefers ponds or lakeshores that have fairly dense aquatic and emergent vegetation during the spring egg-laying season. Breeding habitat typically includes water at least 51 cm (20 in) deep. During the summer the frogs may travel considerable distances into the surrounding terrain. During the winter they hibernate on the bottom of ponds and sluggish streams. Breeding begins in early spring (March or April) in shallow vegetated areas. Suitable habitat exists in wetlands and riparian areas adjacent to Fernan Lake Road from MP 2.0 to MP 5.0. Therefore, northern leopard frogs could occur in the Fernan Creek watershed.

Peregrine Falcon

Peregrine falcons (*Falco peregrinus anatum*) usually nest on sheer cliffs, at least 46 m (150 ft) high. There is no suitable habitat for peregrine falcons in the Fernan Creek watershed due to the lack of cliffs (FS, 1997b).

Townsend's Big-Eared Bat

Caves and cave-like structures are critical habitats for the Townsend's big-eared bat (*Corynorhinus townsendi*) for hibernating in the winter and as roosts for summer nursery colonies. No mines or caves are documented in the Fernan Creek watershed, and no colonies or individual bats have been documented. Some foraging may occur along Fernan Creek or tributaries, but vehicular and human disturbances minimize the chances of the area being used for roosting (FS, 1997b).

Western Boreal Toad

Adult boreal toads (*Bufo boreos bureos*) are mostly terrestrial and nocturnal during dry periods but may forage during daylight hours in rainy or overcast weather. Suitable habitat likely exists in the Fernan Lake area near Lilypad Bay and in other wetland areas adjacent to Fernan Lake Road from MP 2.0 to MP 5.0. Although surveys have not been conducted, populations of boreal toads occur in the area.

Wolverine

Wolverines (*Gulo gulo*) live in low densities in a variety of remote forested habitats. Wolverines tend to use lower elevations in the winter and higher elevations in summer, because of variations in food supply. However, they normally den in higher elevations with snow (Warden, 2000).

No wolverines have been sighted in the Fernan Creek watershed and no denning females are likely to occur below 1,219 m (4,000 ft) (Warden, 2000). The Fernan Creek watershed does contain habitat throughout that is suitable for winter forage; however, vehicular and human disturbances minimize the chance of wolverine presence.

Environmental Consequences to FS Sensitive Wildlife

Effects Common to the Build Alternatives

Direct, Short-Term Effects

Temporary noise disturbance would occur during construction in the project vicinity. If travel corridors between habitat units exist in the project vicinity, they may be disrupted during construction, depending on project timing. However, all species would likely return to the area after project completion. Within the project area, the most suitable habitat for black-backed woodpecker, flammulated owl, and northern goshawk is above MP 5.0 in the IPNF. The road would not be widened above MP 5.0 but would include spot improvements in areas with failing road surfaces, and installation of guardrails, signs, and striping. These activities could cause temporary increases in noise and disturbance, which may displace Sensitive wildlife species should they be present during construction. Affected species would likely move to habitat with lower disturbance levels and reoccupy the project area after construction.

Direct, Long-Term Effects

Of the twelve FS Sensitive species that potentially occur in the IPNF, habitat for seven: black-backed woodpecker, flammulated owl, northern goshawk, Coeur d'Alene salamander, common loon, northern leopard frog, and western boreal toad, may occur in the project area. Direct effects to Sensitive wildlife from the build alternatives would be the same as those for Threatened species (see Section 8.3.1). Amphibians in particular are declining in the Western US and globally. Project effects would not significantly increase the risk of extinction of these Sensitive Species, but cumulative effects would add incrementally to the factors contributing to their decline.

Black-backed woodpecker. Suitable habitat for the black-backed woodpecker is present near Fernan Lake Road above MP 7.0 in the IPNF, and the woodpeckers are considered to be potentially for more information on this species). Under the build alternatives, the road above MP 5.0 would be rehabilitated but not widened or realigned, and no trees would be removed. Therefore, there would be no long-term effects to black-backed woodpecker.

Coeur d'Alene salamander. The Fernan Creek watershed contains some roadside banks and streams that may serve as Coeur d'Alene salamander habitat, although no individuals were found during a survey conducted in 1997. Populations of Coeur d'Alene salamanders are likely to exist in roadside banks and streams above MP 5.0 and in Fernan Creek between MP 2.2 and MP 5.0. The road above MP 5.0 would not be widened or realigned in either build alternative, and effects to Coeur d'Alene salamander would therefore be related to disturbance of habitat (wetlands) between MP 2.2 and MP 5.0.

Common loon. Migratory loons have been sighted on Coeur d'Alene Lake and were sighted on Fernan Lake in 1998, but no nesting loons have been documented nor are they expected to occur. The build alternatives would have no long-term effect on common loons.

Flammulated owl. The Coeur d'Alene River Ranger District conducted surveys in 1998, 1999, and 2000, and no owls were documented. Patches of mature forest habitat are present above 914 m (3,000 ft) in the Fernan Creek watershed 3.2 km (2 mi) from the project, and owls may use adjacent habitat for foraging and may cross the road to reach mature forest in other areas of the IPNF. However, the road above MP 5.0 would be rehabilitated but not widened or realigned under the build alternatives and no trees would be removed. Therefore, the project would not have long-term effects on flammulated owls.

Northern goshawk. Northern goshawks have been sighted for several years in the Hayden Creek vicinity approximately 16 air km (10 air mi) north of Fernan Lake Road. The project corridor is well within their foraging areas, which are documented to be up to 24 air km (15 air mi) from their center of activity. Loss of possible forage habitat could occur under the build alternatives. Loss of forage habitat in riparian and wetland areas due to road widening would occur in Segment 2 and at Lilypad Bay for the build alternatives, however, other foraging areas with less disturbance exist on National Forest land.

Northern leopard frog. Potentially suitable habitat for northern leopard frog exists adjacent to Fernan Lake Road from MP 2.0 to 5.0 in wetland and riparian areas. The build alternatives would reduce habitat in Segments 1 and 2 from road widening and realignment.

Western boreal toad. Suitable habitat for western boreal toad exists near Lilypad Bay and in wetlands adjacent to Fernan Lake Road. Although surveys have not been conducted, it is possible that populations of boreal toads occur in the area. Road relocation and widening at Lilypad Bay and in other wetlands in Segment 2 would cause a slight reduction in habitat for boreal toad.

Cumulative Effects

Cumulative effects are the same for the build alternatives. Because potentially suitable habitat for some of the FS Sensitive species is located in wetland and riparian areas, effects from roads combined with effects from road realignment and bridge construction would result in greater effects to FS Sensitive species than what would occur individually from these actions. Therefore, the build alternatives would contribute incrementally to cumulative effects to FS Sensitive wildlife species.

The No Action Alternative

Direct, Long-Term Effects

The existing road alignment would be retained under the No Action Alternative. None of the project-related activities proposed the build alternatives would take place. The roadway would remain as it is presently, and existing maintenance would continue. Inadequate water flow through the one visible culvert under the road in Lilypad Bay would continue to adversely affect habitat on both sides of the existing fill. Disturbance to stream channel and flows from agricultural activities in segment 2 would not be remedied.

Under the No Action Alternative, yearly road maintenance (spot improvements in areas of failing road surfaces, signage, culvert replacement, striping, etc.), would increase because of the projected increase in traffic and because portions of the road would continue to be in poor condition. The maintenance activities would have temporary effects and possibly cause minor loss of habitat for the Coeur d'Alene salamander, the boreal toad, and the northern leopard frog, depending on the extent of the maintenance activity.

The No Action Alternative would allow continued use of the road without adequate stormwater management. An accidental leak or spill of petroleum products would be likely to affect water bodies since there are insufficient drainage measures to capture spilled fluids before entering the lake and creek. Thus, the probability of habitat damage from petroleum products may be slightly greater for the No Action Alternative than for the build alternatives, which include improved stormwater management features.

Cumulative Effects

The No Action Alternative would continue to contribute incrementally to overall habitat degradation in the Fernan Creek watershed. Inadequate stormwater management would continue to allow runoff from impervious surfaces to flow directly into Fernan Creek and Lake, washing petroleum and other contaminants from the road surface into the water and degrading wetland habitat. Inadequate water flow through the one visible, existing culvert at Lilypad Bay would continue to adversely affect habitat on both sides of the existing fill. In addition, other development, both public (logging, other IPNF uses) and private (residential development, agriculture), would continue to occur.

Management Indicator Species (MIS)

MIS are species selected to estimate the effects of management activities on wildlife populations. The MIS in the IPNF are identified in the Forest Plan and include several categories of species: federal Threatened and Endangered, commonly hunted or trapped species, and species whose population changes are believed to indicate effects of management on other species or biological communities. Species associated with mature forests and big-game species are the primary MIS in the project area.

Species associated with mature forests and big-game species are the primary MIS in the IPNF portion of the project area. Neotropical migratory birds are also discussed in this section. MIS associated with mature forests include northern goshawk, pileated woodpecker, and pine marten. Big-game species such as deer and moose occur in the project area, but only elk are analyzed in this section because elk are considered the MIS for all big game according to the FS.

MIS Associated with Mature Forests
Mature forest occurs approximately 3.2 km (2 mi) from Fernan Lake Road in the IPNF (Warden, 2002). Mature forest MIS may use habitat adjacent to the road for foraging and may cross Fernan Lake Road to access mature forest habitat. The area adjacent to Fernan Lake Road occasionally provides a travel corridor between mature forest habitat units.

The MIS associated with mature forests include the northern goshawk, pileated woodpecker (*Dryocopus pileatus*), and pine marten (*Martes americana*). A small portion of the Fernan Creek watershed consists of mature forest habitat in the IPNF, approximately 3.2 km (2 mi) from Fernan Lake Road (FS, 1997b). However, MIS may use habitat adjacent to the road for foraging and as travel corridors and may cross Fernan Lake Road to reach mature forests in other locations in the IPFN.

Northern goshawk is categorized as an MIS and FS Sensitive species. Habitat description and occurrence near Fernan Lake Road were discussed previously.

Pileated woodpeckers generally inhabit mature, old growth, and second growth forests with significant numbers of large snags and fallen trees. Conifer forests with at least two canopy layers are preferred. Pileated woodpeckers nest from mid-March to mid-July. They excavate a new nest each year in large snags generally greater than 51 cm (20 in) in diameter. The woodpeckers are expected to exist throughout most of the Fernan Creek watershed where snags and fallen trees are present. A documented nest occurs approximately 4.8 km (3 mi) north of Fernan Lake in the IPNF (Warden, 2001). Suitable habitat exists approximately 3.2 km (2 mi) from Fernan Lake Road in the IPNF segment of the road, and pileated woodpeckers are likely to use the area for foraging (FS, 1997b).

Pine marten is a solitary carnivore that inhabits primarily mid- to high-elevation, mature coniferous forests with greater than 30 percent canopy coverage. Such habitat protects the species from predators and enhances the moist conditions favorable for prey. Fallen trees, stumps, snags, and talus are important habitat components that provide denning sites and access to prey under snow cover. The considerable amount of fallen trees, talus, etc.

associated with pine marten habitat limits cattle from accessing these areas. Large clear-cuts and fires are considered to reduce quality of pine marten habitat. The Fernan Creek watershed area does not have an abundance of late successional stage forest (Warden, 2001). However, suitable habitat may exist near Segment 3 of Fernan Lake Road. Therefore, pine martens are may occur in the area (FS, 1997b).

Big-Game MIS

Humans artificially control some populations of MIS. In Idaho, IDFG has transplanted elk, woodland caribou, and mountain goats to augment low populations and increase distribution. Unlike carnivores, big-game species such as white-tailed deer (*Odocoileus virginianus*), elk (*Cervus elaphus*), and moose (*Alces alces gigas*) are more abundant now than historically, due in large part to continued creation of early succession foraging habitats through timber harvests and IDFG's population management objectives. White-tailed deer, moose, and elk inhabit the Fernan Creek watershed, and, although areas along the road are not optimal habitat (FS, 1997b), white-tailed deer and moose were observed 30 m (100 ft) from Fernan Lake Road in the project area during field visits in August 2001. This section focuses on elk because it is the MIS for all big game, according to the IPNF Forest Plan.

Elk were extirpated after the Europeans arrived; however, reintroductions of elk in the early 1900s compensated for the loss. Timber harvesting has created meadows that provide abundant browsing and grazing for big game, and elk numbers have increased. Elk in northern Idaho generally use geographically separate winter and summer ranges. Optimal winter range is characterized by elevations below 1,219 m (4,000 ft), primarily south-facing slopes with snow accumulations less than 46 to 61 cm (18 to 24 in), and minimal human disturbance. Summer range is characterized as having a greater prevalence of open-canopy forest interspersed with grass-. forb-, or shrub-dominated foraging habitat. It is typically located above 1,219 m (4,000 ft) elevation. Because the majority of the watershed occurs below 1,219 m (4,000 ft) elevation, it primarily provides elk winter range.

A significant management concern for elk is lack of security. Security areas do not typically occur within 3.2 km (2 mi) of existing roads (Warden, 2001). Elk require thermal cover and hiding cover, safe areas greater or equal to 101 ha (250 ac), and secure escape routes. Fernan Lake Road creates a certain level of disturbance to big game by allowing human accessibility and traffic. Elk are more likely to occur in secure areas, away from roads and traffic. However, big game such as moose and deer were observed near the project area during field visits. The project area provides wintering habitat, but elk may also use the project area as a travel corridor between suitable, secure habitat units.

Neotropical Migratory Birds

Neotropical migratory birds breed and nest within the project area, but winter in South and Central America. There are more than 100 species of neotropical migratory birds documented on the Coeur d'Alene River Ranger District. Neotropical migratory birds are primarily songbirds but also include some raptor and shorebird species. Each group has specific habitat requirements and occupies habitats such as coniferous and deciduous forest, meadows, riparian areas, wetlands, and sub-alpine habitat.

Although neotropical migratory birds occupy all habitats in the Fernan Creek watershed area, over 80 percent of the birds use riparian habitat for nesting or foraging during a portion of their annual cycle (Krueper, 1992). Diversity of riparian structure and composition along with the presence of water enables these areas to satisfy habitat requirements of many species. The wetlands from MP 2.0 to MP 5.0 provide the most diverse habitat for neotropical migratory birds.

Brown-headed cowbirds (*Molothrus ater*) pose a threat to neotropical migrant birds by nest parasitism. Cowbirds are associated with livestock grazing because they use grazed lands as feeding areas (Robinson, 1992). Urbanized areas along Fernan Lake Road pastures and habitat created by holes in forest canopies provide suitable habitat to brown-headed cowbirds, particularly if trees in these areas are allowed to die naturally, thereby creating similar openings and opportunities for cowbird nest parasitism (FS, 1999c).

Environmental Consequences to MIS

Direct, Short-Term Effects on Mature Forest MIS

The build alternatives may cause temporary disturbance from construction noise and dust to northern goshawk, pileated woodpeckers, or pine marten, should they be in the vicinity at the time. Individuals of these species would probably merely move away from the construction area during periods of disturbance. These effects would cease when construction was completed and the species would most likely return to the area.

Direct, Long-Term Effects on Mature Forest MIS

The build alternatives involve road widening and realignment from MP 0.1 to MP 5.0. However, forest structure in this area is not considered mature. Most of the realigned route under the build alternatives would be located adjacent to the existing road in the primary road ROW or on land previously altered by timber harvesting or private development. The majority of mature forest in the project area is located above MP 5.0 and approximately 3.2 km (2 mi) from Fernan Lake Road. Because the road would be rehabilitated and not widened from MP 5.0 to MP 10.7 and the area is used only as MIS forage habitat, the build alternatives would not have a long-term effect on northern goshawk, pileated woodpecker, pine marten, or other wildlife associated with mature forest.

Other activities such as timber harvesting, private development, hunting, the nearby shooting range, and snowmobiling affect MIS habitat and populations. Such activities have a substantially greater influence on MIS populations than road improvements in Segments 1 and 2 or road rehabilitation in Segment 3 would have. Effects from road widening and realignment combined with other effects generally result in greater effects to MIS than would occur individually from these actions. Therefore, the build alternatives would contribute incrementally to cumulative effects to MIS.

Direct, Short-Term Effects on Big-Game MIS

Construction would most likely occur during summer, so there would be no direct conflict for elk during critical wintering months. Noise disturbance during construction would occur in the project vicinity. However, these effects would be minimal and would not adversely affect big-game populations.

Direct, Long-Term Effects on Big-Game MIS

The existing road between MP 5.0 to MP 7.0 is located in FS Management Unit MA-4. No road widening or realignment would occur in this location under the build alternatives, and big-game security and cover would not be affected by proposed road rehabilitation in this area. Assessment of direct effects to big game is determined by calculating the acreage affected by each alternative. Areas outside the ROW from MP 0.0 to MP 5.0 are located on private property not managed by the FS. However, the entire project area is evaluated for effects to big game. Some effects would occur to potential big-game wintering habitat from MP 0.0 to MP 5.0 due to road widening and realignment. Big game normally disperse upland during summer and part of fall in search of better forage. The road realignment would reduce available wintering habitat in the vicinity of the existing road. However, suitable cover/forage exists approximately 3.2 km (2 mi) from Fernan Lake Road in the IPNF.

Other activities such as timber harvesting, private development, hunting, the nearby shooting range, and snowmobiling affect MIS habitat and populations. Such activities have a substantially greater influence on MIS populations than road improvements in Segments 1 and 2 or road rehabilitation in Segment 3 would have. Effects from road widening and realignment combined with other effects generally result in greater effects to MIS than would occur individually from these actions. Therefore, the build alternatives would contribute incrementally to cumulative effects to MIS**.**

Direct, Short-Term Effects on Neotropical Migratory Birds

Noise disturbance during construction would occur in the project vicinity, therefore migratory birds which nest or forage within the project area may be temporarily displaced. Neotropical migratory birds are expected to return to the project area following construction.

Direct, Long-Term Effects on Neotropical Migratory Birds

Neotropical migratory birds breed and nest within the project area. Effects to migratory bird habitat in riparian and wetlands in Segments 1 and 2 would occur as a result of road improvements for the build alternatives.

Cumulative Effects

Other activities such as timber harvesting, private development, hunting, the nearby shooting range, and snowmobiling affect MIS habitat and populations. Such activities have a substantially greater influence on MIS populations than road improvements in Segments 1 and 2 or road rehabilitation in Segment 3 would have. Effects from road widening and realignment combined with other effects generally result in greater effects to MIS than would occur individually from these actions. Therefore, the build alternatives would contribute incrementally to cumulative effects to MIS.

The No Action Alternative

Direct, Long-Term Effects

The existing road alignment would be retained under the No Action Alternative. None of the project-related activities proposed under the build alternatives would take place. The roadway would remain as it is presently, and existing maintenance would continue. Significant effects to MIS or neotropical bird species are not expected from on-going road maintenance activities.

Cumulative Effects

The No Action Alternative would continue to contribute incrementally to overall habitat degradation in the Fernan Creek watershed. Inadequate stormwater management would continue to allow runoff from impervious surfaces to flow directly into Fernan Creek and Lake, washing petroleum and other contaminants from the road surface into the water and degrading wetland and foraging habitat. Inadequate water flow through the one visible, existing culvert at Lilypad Bay would continue to adversely affect habitat on both sides of the existing fill. In addition, other development, both public (logging, other IPNF uses) and private (residential development, agriculture), would continue to occur.

ESA Threatened and Proposed Threatened Plants

The sub-basins of northern Idaho contain a diversity of habitats and plant communities. Of the estimated 1,200 to 1,500 plant species known or thought to grow in the region, about 10 percent are considered rare or uncommon. There are no federally listed Endangered plants on the IPNF. However, three Threatened plant species, Ute ladies'-tresses (*Spiranthes diluvialis*), water howellia (*Howellia aquatilis*), and Spalding's catchfly (*Silene spaldingii*), may occur in the Fernan Creek watershed area (Table 3-11).

Field surveys for Ute ladies'-tresses and water howellia have been conducted in the project area. No Sensitive or Threatened plants were identified during the surveys, but potential habitat for moist, wet, and aquatic species was observed along the project route. Biologists surveyed areas along the project route that were most likely to contain suitable habitat for Ute ladies'-tresses and water howellia.

The Coeur d'Alene River Ranger District conducted several surveys in 1999 and 2000 in the IPNF, and no Spalding's catchfly were found (Goodnow, 2001). Suitable habitat is present in the project area based on Satellite Imagery Classification data analysis (Mousseaux, 2000). Habitat for this species most likely exists in the upland areas within the project area, and in particular, the area above Fernan Lake Road east of Lilypad Bad at about MP 2.1 to MP 2.2.

Table 3-11. FWS Threatened and Proposed Threatened Plant Species Potentially Occurring in Project Area

Common (scientific) name	FWS listing	Habitat requirements	Potential habitat	Presence	Rationale
Ute ladies'-tresses (Spiranthes diluvialis)	Threatened	Open wet meadows, deciduous riparian and shrub communities.	Yes	Potential	Potentially suitable habitat in project area.
Water howellia (Howellia aquatilis)	Threatened	Vernal pools, glacially formed pothole ponds, and old river oxbows.	Yes	Potential	Potentially suitable habitat in project area.
Spalding's catchfly (Silene spaldingii)	Threatened	Grasslands dominated by perennial grasses such as Idaho fescue (Festuca idahoensis) or rough fescue (Festuca scabrella).	Yes	Potential	Potentially suitable habitat in project area.

None of the plant species were found during any of the surveys. According to the FS, when highly suitable habitat for a species has been identified, presence of the species is assumed until proven otherwise with a field survey (FS, 1991a).

Environmental Consequences to ESA Protected Plants

Effects Common to the Build Alternatives

Road projects typically result in loss of native plants, the invasion of exotic species, and accompanying consequences. Although there are no Endangered plants in the IPNF, two Threatened and one Proposed Threatened plant species may occur in the Fernan Creek watershed: Ute ladies'-tresses, water howellia, and Spalding's catchfly. Studies to date of the Fernan Lake Road project area have not found populations of these three species. Potential effects to these species are fundamentally the same for each of the build alternatives, with the quantity of habitat impacts as the only exception.

Potentially suitable wetland and riparian habitat for Ute ladies'-tresses and water howellia may occur within the project area and portions of it will be impacted by the build alternatives. Potentially suitable upland forest habitat for Spalding's catchfly occurs in all of the project segments and portions of it will be impacted by the build alternatives. Direct impacts could occur to individual plants, should they exist within these potentially suitable habitats.

The build alternatives may also affect Threatened and Proposed Threatened plants due to removal of native plant species and soil as a result of project activities. Plant species within the area of disturbance would be permanently removed, crushed, or buried. Micro-habitat and species niches may be lost. Clearing activities would expose soils and could promote invasive and exotic plant species establishment. In addition, surface soil horizons might be lost due to mixing with less supportive subsurface horizons, reducing the likelihood of re-establishment of Threatened and Proposed Threatened populations.

The build alternatives may permanently alter the hydrology of the site, resulting in undesired changes to potentially suitable ute ladies'-tresses and water howellia habitat.

Cumulative Effects

Other forest management practices affect Threatened and Proposed Threatened plant species in the project area. Timber harvesting, private development, and routine road maintenance can result in direct effects to habitat or populations. Under the build alternatives, impacts from road widening and realignment combined with the other impacts generally result in greater impacts to plant species than would occur individually from these actions. Therefore, the build alternatives would contribute incrementally to cumulative impacts to Threatened and Proposed Threatened plant species.

The No Action Alternative

Direct, Long-Term Effects

The existing road alignment would be retained under the No Action Alternative. None of the project-related activities proposed under the build alternatives would take place, and the roadway would remain as it is presently. Current road maintenance activities would continue and increase over time to maintain the road in a drivable condition. However, no direct loss of habitat would occur.

Cumulative Effects

Because the No Action Alternative would not affect additional habitat for Threatened or Proposed Threatened plants, the No Action Alternative would not contribute to cumulative effects on these species.

FS Sensitive and FS Species of Concern Plants

Within the Coeur d'Alene River Ranger District, 30 FS Sensitive and 22 FS Species of Concern plants are known or expected to occur. Of these, 20 FS Sensitive and 11 FS Species of Concern potentially occur in the project area based on range and habitat conditions. FS Species of Concern are species that may not be at risk on a rangewide, regional, or state scale but may be imperiled within a planning area, such as a National Forest (FS, 1997a). Species of Concern are addressed in biological analyses to provide for maintenance of population viability as directed in NFMA (NFMA, 1976). Sensitive species and Species of Concern can be assigned to one or more rare plant guilds and artificial assemblages with similar habitat requirements for purposes of analysis. Rare plant guilds in the IPNF include aquatic, deciduous riparian, peatlands, wet forest, moist forest, dry forest, and sub-alpine. Rock seeps and springs can also support certain Sensitive plants, although the plants can occur across all guilds and are not identifiable at a coarse scale.

No plants in the peatlands, deciduous riparian habitat, and sub-alpine habitat occur in the project area.

Although none of the Sensitive or Species of Concern plants has been documented in the Fernan Creek watershed, potential habitat exists for 20 Sensitive species and 11 Species of Concern. Discussion of these species, which may occur in the area, follows. Descriptions of the 9 FS Sensitive moonwort species are combined. Descriptions of devil's matchstick lichen (*Pilophorus acicularis*) and Christmas tree lichen (*Sphaerophorus globosus*) are given together because detailed habitat information was not available. Both species are found in wet forest habitat according to the FS Habitat Guilds classification. Information concerning the potential for habitat in the Fernan Creek watershed for each of these plants was provided by the FS (Goodnow, 2001; Goodnow, 2002).

Environmental Consequences to FS Sensitive and FS Species of Concern Plants

Effects Common to the Build Alternatives

Habitat (moist, wet, or dry) exists in the project area for 20 FS Sensitive and 11 FS Species of Concern plants. Effects to these species and their habitat within the project area would result from implementation of the build alternatives, as habitat would be removed for road widening in Segments 1 and 2 and as a result of removing the road fill at Lilypad Bay.

Habitat in Wetlands, riparian areas of Fernan Creek, and wetland areas in Lilypad Bay would be affected. Potential habitat for plant species in the moist and wet habitat below MP 5.0 would be affected by construction activities. Road-widening or realignment would not affect clustered lady's slipper and bank monkeyflower, which may occur above MP 5.0. The build alternatives may affect species in dry forest habitat, including include Howell's gumweed and red-flowered current, because the road would be widened and some dry forest exists to the north of Fernan Lake Road. Habitat for imbricate lichen would be affected by the build alternatives in all segments of the project because habitat for this species is located in disturbed areas at the edge of the road and in the existing road shoulder. Any individual plants present in the project construction area would likely be eradicated. However, the build alternatives are not likely to cause a loss of viability for these species because viable populations of the plants exist elsewhere in the IPNF.

The build alternatives may also affect FS Sensitive and Species of Concern plants due to removal of native plant species and soil as a result of project activities. Plant species within the area of disturbance would be permanently removed, crushed, or buried. Micro-habitat and species niches may be lost. Clearing activities would expose soils and could promote invasive and exotic plant species establishment. In addition, surface soil horizons might be lost due to mixing with less supportive subsurface horizons, reducing the likelihood of re-establishment of Sensitive and Species of Concern populations, should they be present.

Other forest management practices affect Sensitive and Species of Concern plants in the project area. Timber harvesting, private development, and routine road maintenance can result in direct effects to habitat or populations. Under the build alternatives, impacts from road widening and realignment combined with the other impacts generally result in greater effects to plant species than would occur individually from these actions. Therefore, the build alternatives would contribute incrementally to cumulative impacts to Sensitive and Species of Concern plants.

The No Action Alternative

Direct, Long-Term Effects

The existing road alignment would be retained under the No Action Alternative. None of the project-related activities proposed under the build alternatives would take place, and the roadway would remain as it is presently. Current maintenance activities would continue and would increase to keep the road in a drivable condition. However, there would be no direct loss of habitat for FS Sensitive or Species of Concern plants.

Cumulative Effects

Because the No Action Alternative would not result in loss of habitat for Sensitive or Species of Concern plants, the No Action Alternative would not contribute to cumulative effects on these species.

Consistency with IPNF Forest Plan

Alternatives E, G, Fm

These alternatives would affect the wetland and riparian areas adjacent to the road in Segments 1 and 2. This would cause direct effects to water quality, fish habitat, and some plant habitat. The Forest Plan requires management and construction of roads in a manner consistent with protection and management of other resources. Forest Plan standards provide specific management direction. These alternatives do meet the standards for Threatened and Endangered wildlife, but do not meet standards for Threatened and Endangered plant species. The impacts to Fernan Creek would result in a loss of potentially suitable habitat for plant species and possibly a loss of individuals, should they be present. However, potential long-term benefit to fish habitat would result from proposed impact mitigation. Meanders, native riparian plantings, and LWD would be added to the new creek alignment, increasing bank stability and habitat complexity; and lengthening the channel and moderating flows. The riparian plantings will increase LWD recruitment potential. Over time, restoration may result in consistency with the Forest Plan for aquatic resources.

Timber harvesting, road construction, farming, and private development have created the majority of adverse effects to water quality in the project area. Stormwater management measures would incrementally reduce sediment, nutrient pollutants, pathogens, and temperature in reaches currently affected by cumulative actions. This would contribute to the overall goal of restoring beneficial uses in Fernan Creek and Fernan Lake. However, water quality would continue to be limited by timber harvesting, roads, farming, and private development.

The No Action Alternative

Direct, Short-Term Effects

The No Action Alternative would not create adverse effects on fish habitat and sensitive plant populations from the construction of the project. However, adverse affects to fish habitat from past timber sales and other activities, both public and private, would remain.

Cumulative Effects

The No Action Alternative would have a beneficial cumulative effect, assisting in fish habitat and population recovery from past disturbances, although improvements might be scarcely noticeable. Reduction of sediment input from one road construction project would not likely compensate for ongoing effects from existing development and timber harvesting, which would continue.

Mitigation Measures

Mitigation measures specifically for the Fernan Lake Road project are outlined below. Changes in the design or construction techniques may make some listed mitigation measures obsolete or unnecessary.

Mitigation Measures for the Build Alternatives

Mitigation measures recommended to protect aquatic resources under the build alternatives would consist of the following:

<u>Project design</u>

1. BMPs, as described in the Standard Specifications for the Construction of Roads and Bridges on Federal Highway Projects (FHWA, 1996), should be implemented during construction. BMPs include measures for erosion and sedimentation control, pollution control, stormwater management, spill prevention control and countermeasures, and construction waste handling. Each BMP applicable to project conditions should be employed.

2. Stormwater treatment and detention should capture as much road runoff as practicable, and filter it before it enters water bodies. Stormwater should be diverted away from the lake and creek and into detention/infiltration facilities before entering water bodies. Concentration of road drainage in unstable areas should be avoided. Stormwater facilities should be designed in accordance with applicable state, county, and local agency requirements.

3. Where the road parallels Fernan Creek and Fernan Lake, future snow storage should be away from the creek and lake. Snow removal should be done in a manner that avoids damage to resources. Snow should not be stored near creeks or where snowmelt would cause erosion. This is contingent upon agreement by ESHD when they accept the completed project.

4. Where aggregate or earth type material is used for paving or accumulates on the road, every effort should be made to prevent deposits of material into the water bodies.

5. Approach material should be structurally stable and composed of material that if eroded into water would not be detrimental to fish life.

6. Stabilization of road slopes through hydro-seeding and control of road surface drainage should be implemented. Bank sloping should be accomplished in a manner that avoids release of overburden material into water bodies. Overburden material from the project should be deposited so that it does not re-enter the water.

7. Riprap materials used for structure protection in the Lilypad Bay area should be clean, angular rock, which should be installed to withstand 100-year peak flow. Fish passage structures should be constructed with rocks, as required by permit stipulations.

8. Within one year of project completion, road banks should be revegetated with native or other approved woody and herbaceous species. Vegetative cuttings should be planted at a maximum interval of 1 m (3 ft) (on center) and maintained as necessary for three years to ensure 80 percent survival (or as specified in the COE permit or other approvals).

9. Riparian areas should be replanted at a 1:1 ratio with in-kind plant species. A mitigation monitoring plan would be developed for COE approval. Monitoring parameters may include water quality, fish habitat, riparian vegetation, and bank stability conditions in the creek after project completion for three years or as stipulated in the COE permit.

Construction

10. Sidecasting of old asphalt should not be permitted. Old roadbed materials should either be recycled on site or removed to a suitable disposal area. Removal of the existing roadway should be accomplished so that structure and associated material does not re-enter water bodies.

11. Vegetation clearing (including selected tree removal within the ROW) and subsequent hauling should not occur during the wet season, if possible, and should be completed prior to May 1 (prior to bird nesting season).

12. If possible, some of the trees removed from the ROW during construction should be placed in the edge of the lake to add structure to the shallow water habitat.

13. Only clean, inert material should be allowed to contact water bodies. No earth fill cofferdams should be allowed.

14. Alteration or disturbance of banks and bank vegetation should be limited to the minimum necessary to construct the project. Within seven calendar days of project completion, all disturbed areas should be protected from erosion using vegetation or other means.

15. Spoil piles from excavation should be stored outside the 100-year floodplain, not within water features, or hauled to an approved site. Appropriate de-watering ponds should be provided below all spoil deposits.

16. Excavation and fill in the lake and creek channel should not occur when fish such as westslope cutthroat trout are spawning or when eggs are incubating in gravel (from April 1 to July 30) if such activities could potentially impact spawning areas.

17. When practicable, surface-to-bottom in-water silt curtains should be used around all in-water sediment disturbance activities, as stipulated by IDL and other permits. Silt fences should be placed adjacent to all water features (riparian, wetland, and lake) during culvert replacement activities to intercept sediments during construction.

18. When practicable, gabions should be used directly below culvert outlets draining into perennial streams, creeks, and lakes.

19. When conditions allow, planted vegetation or jute netting should be used on side slopes adjacent to culvert outlets to control erosion.

20. The Coeur d’Alene River Ranger District and the IDFG should be notified prior to construction in sensitive areas such as creeks, wetlands, and lakes.

21. A blasting plan should be submitted to appropriate agencies for approval prior to any blasting activities. The plan should address any tactics needed to remove

and/or scare fish from the site, micro-second timing delays in blasting, and damage assessment procedures.

22. The possibility of toxic pollution should be controlled by requiring that, when practicable, all equipment be maintained and refueled on impervious surfaces out of the 100-year floodplain, so as to contain potential spills and stormwater runoff. A Spill Prevention Control and Countermeasures Plan should be developed, approved, and implemented to contain any spills that occur.

23. The contractor should implement all stipulations and conditions contained in the permits acquired by FHWA.

24. Equipment used for this project should be free of external petroleum-based products while working around the lake or creek. Equipment should be checked daily for leaks and necessary repairs should be completed prior to commencing work activities along or above water bodies. No fuel, petroleum-based products, or deleterious materials should be stored on temporary work platforms over the lake or creek.

25. Municipal water should be used during construction to control dust. Oil should not be used. Water from Fernan Lake, but not from Fernan Creek, could be used to meet construction needs if municipal water is not available.

26. A Stormwater Pollution Prevention Plan (SWPPP) should be part of the permit applications (IDEQ, IDL, IDFG, etc.). The SWPPP should include a provision for monitoring during construction.

27. Heavy equipment should not be operated outside construction limits in areas with soil moisture limitations.

28. Erosion control observation should occur on a weekly or daily basis during construction, depending on precipitation. The observer should be responsible for monitoring all temporary and sedimentation control structures and downstream conditions in the project area. Erosion control measures should be implemented if work is incomplete at the end of the dry season. The FHWA construction engineer should also be a liaison between the project and the county, IDFG, COE, FWS, and other agencies for issues related to fisheries, stream and wetland mitigation.

29. Where the one visible existing culvert is to be removed and the proposed bridge constructed (between MP 2.0 and MP 2.1 under Alternatives B, E, and G), work should be limited as much as possible to the low-flow season (summer, fall, and winter).

30. Wastewater from project activities and water that may be removed from the work area during construction should be detained to allow removal of fine sediment and other contaminants and to meet Kootenai County Stormwater Standards, prior to being discharged to state waters.

31. Extra precautions should be taken for equipment operation around water features to prevent contamination.

32. Structures containing concrete should be sufficiently cured prior to contact with water to avoid leaching. Measures should be used to prevent fresh concrete from coming into contact with state waters.

33. Temporary, approved toilet facilities should be provided on-site during construction. The temporary toilets should be located away from the lake and creek.

<u>Measures for Alternative G Only (Preferred Alternative)</u>

Bridge construction:

34. If possible, the new bridge should be built before the existing road is removed, allowing the existing road to trap most of the sediment created during bridge construction.

35. The proposed bridge should be constructed so as to pass the 100-year peak flow, with a consideration of debris likely to be encountered.

<u>Mitigation Measures Recommended to Protect Terrestrial Resources</u>

36. Clearing and grubbing of potential nest-bearing vegetation in the project area should not take place during the migratory bird breeding season, which occurs from approximately May 1 to July 15.

37. Because nesting activity for bald eagles usually occurs from January 1 to August 15, blasting and pile driving within 1.6 km (1 mi) of eagle nests should take place after August 15 or after chicks have fledged if the nest is determined to be active. A biological monitor to be determined by FHWA in conjunction with partner agencies should verify that chicks have fledged prior to construction in the area. Regular construction activities should be limited when within 0.8 km (.50 mile) of the nest. This mitigation measure can be modified following a more detailed noise analysis and discussions with USFWS.

38. Grass mixes specified for ditches and sideslopes should be used with browse seed mix such as elderberry, oceanspray, mountain maple, and red-stem ceanothus to enhance wildlife habitat on disturbed areas. Seed mix should be approved by the FS and ESHD.

39. Temporary, approved toilet facilities should be provided onsite during construction. The temporary toilets should be located away from the lake and creek.

40. Garbage created during construction should be collected and hauled to a proper disposal facility. Food waste should be properly disposed of.

41. If necessary as determined by the IPNF, snags should be created where snags have been removed for safety reasons.

42. Where big-game winter ranges overlap the project area, rock crushing, blasting, and other loud noise-generating activity that may disturb wintering big game should be timed to avoid the wintering period, if possible.

43. Additional surveys for Threatened, Endangered, and Sensitive plant species may be needed according to FWS protocols prior to construction to ensure that no individual species are present.

44. Meadow areas and wetlands should not be used as staging areas for tree removal or other construction-related activities.

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3.7 LAND USE

Land uses in the project area are governed by differing regulations, depending on jurisdiction. Federally owned forest lands (in Segment 3) under FS jurisdiction are governed by the *IPNF Forest Plan* (FS, 1987). Land in unincorporated Kootenai County (in both Segments 1 and 2) is subject to the comprehensive plan, zoning ordinance, and site disturbance ordinance of Kootenai County. Land in the City of Coeur d'Alene (in Segment 1) is subject to the comprehensive plan and zoning ordinance of the City of Coeur d'Alene, and land in Fernan Lake Village (also in Segment 1) is subject to the comprehensive plan and zoning ordinance of Fernan Lake Village.

Federal and state policies and regulations relating to specific issues (e.g., cultural resources, biological resources, recreation, and water quality) are discussed in the respective technical reports.

Existing Land Uses

Land uses abutting Fernan Lake Road are suburban residential and recreation in Segment 1 and agricultural (grazing) and rural residential in Segment 2. Segment 3 is located entirely within the IPNF. Segment 3 uses include, timber harvesting, hunting, recreation (a shooting range), and National Forest-related activities such as trails for year-round hiking and all-terrain vehicle (ATV) and snowmobile use. Distances along the road are indicated by mileposts (MPs) and approximate mileposts for parcels and features are provided for reference.

Segment 1

Three roads converge at the beginning of the project area (MP 0.0): Fernan Court, Lakeview Drive, and Fernan Lake Road. The streets are lined with single-family residences on urban-size lots. Right-of-way for Fernan Lake Road is in unincorporated Kootenai County from its junction with Sherman Avenue near I-90 to the National Forest boundary (MP 5.0). East of I-90 and south of Fernan Lake Road is the small, incorporated community of Fernan Lake Village. Land uses in Fernan Lake Village are predominantly single-family residential, but also include a lakeside park and boat ramp and offices of the Coeur d'Alene River Ranger District of the FS, commonly known as the Fernan Ranger Station.

Properties north of the Fernan Lake Road ROW (from I-90 to approximately MP 0.7), including homes that back Fernan Lake road and homes that face Fernan Terrace Drive and Fernan Hill Road, are in the City of Coeur d'Alene. Figure 3-11a shows jurisdictions in the area. Land shown in Figures 3-11b through 3-11e is all in unincorporated Kootenai County.

In addition to the community lake access (Parcel 2) at the beginning of the project, other public recreational facilities along the route include the Fernan fishing dock (MP 1.85) and the East Fernan boat launch (MP 2.15), both situated on the lake side of the road. KCPW maintains the Fernan fishing dock, and the access ramp area is in the FS easement area for Fernan Lake Road. The East Fernan boat launch is located on private property

Figures 3-11a through 3-11e. Insert

(Parcel 39) but is maintained and operated by KCPW. Several homes between MP 0.8 and MP 1.5 also have private boat docks. Impacts of the proposed project on recreation are addressed in Section 3.9.

Segment 2

As Fernan Lake Road leaves the lake and heads north toward the National Forest, the character of adjacent land uses changes. Residences are located on larger rural or agricultural lots on both sides of the road. East of the road are fenced pastures for grazing.

Segment 3

Segment 3 is located entirely within the IPNF. The Fernan Rod & Gun Club is located east of the road at approximately MP 5.2 and operates in the IPNF under a Special Use Permit from the FS, commonly known as the Fernan Ranger Station.

Existing Zoning Designations

The easement for Fernan Lake Road lies on land in unincorporated Kootenai County and adjacent to land governed by four jurisdictions: City of Coeur d'Alene, City of Fernan Lake Village, Kootenai County, and the IPNF.

The land within the City of Coeur d'Alene located north of Fernan Lake Road (within the project limits between MP 0.0 and MP 0.7) is zoned Residential-3 (R3). R3 lands are primarily intended for single-family residential use where overall housing density does not exceed 3 units per acre (ac) (1 ac = 0.4 hectare [ha]).

The City of Fernan Lake Village is located south of Fernan Lake Road between I-90 and Fernan Lake (within the project limits between MP 0.0 and MP 0.1),. Parcels adjacent to the project are zoned Residential 1 (R1). R1 lots must be a minimum of 929 square meters (m^2) (10,000 square feet [ft^2]), with an average width of at least 30.5 m (100 ft).

Land on the north shore of Fernan Lake from approximately MP 0.7 to MP 3.0 is under the jurisdiction of unincorporated Kootenai County and zoned Agricultural Suburban (AS). AS lands are intended for residential and agricultural uses and must have minimum lot sizes of 2,515 m2 (8,250 ft2).

The eastern part of Coeur d'Alene and parts of adjacent Kootenai County (to approximately MP 2.6) constitutes the formally adopted Area of City Impact. The State of Idaho code requires an agreement between cities and counties to coordinate land use planning in Areas of City Impact. Both Coeur d'Alene and Kootenai County have regulations for the Area of City Impact that coordinate the provision of urban services and annexation. The regulations do not affect the project.

Land directly adjacent to Fernan Lake is zoned Surface Water Resource Area. Development or construction in this zone requires a Site Disturbance Permit.

Land along the northern half of Segment 2 (approximately MP 3.0 to MP 5.0) is zoned Rural (R). Uses permitted in R zones are rural residential and agricultural (including forestry). Lots under 2.0 ha (5 ac) are restricted to one single-family dwelling as a primary use. Lots over 2.0 ha (5 ac) may be used for farming and agriculture, public parks and recreational facilities, single-family dwellings, and miscellaneous uses.

Land in Segment 3 is entirely within the IPNF and managed by the FS. The Forest Plan provides forest-wide standards for road construction and reconstruction. Forest Plan policies relevant to Fernan Lake Road mandate that the IPNF provide and maintain public road and trail access to National Forest lands. Roads are to be managed for public use consistent with management area goals and needs for protection of facilities. Road construction and reconstruction are to be kept to the minimum necessary to efficiently meet safety, user, and resource needs. Design speeds are to reflect cost efficiency and effectiveness, user needs, and safety and environmental concerns. Single-lane roads are to be preferred, although roads designated as Main Travel Routes can be constructed with two lanes.

The IPNF Road Management Plan designates Fernan Lake Road as a Main Travel Route. As such, the road is generally open year-round without restriction. The ESHD maintains the entire length of the road but clears snow only as far as the shooting range. However, a local snowmobile club plows Segment 3 in winter.

Inside the IPNF, the road crosses four FS Management Areas (MA's): 1, 4, 9, and 16.

MA-1 lands are managed for timber production and for long-term growth and production of commercially valuable wood products. Road use is based on needs identified in project-level planning.

MA-4 lands are managed for timber production and big game winter range. Roads in the area are to be smallest necessary to meet transportation objectives and area management goals and to protect resources.

MA-9 lands are managed to maintain and protect existing improvements and resource production potential and to meet visual quality objectives. MA-9 lands consist of non-forest lands, lands not capable of producing industrial products, lands physically unsuited for timber production, and lands capable of timber production but isolated by other lands or by nonpublic ownership. No local road construction is currently planned in this area.

MA-16 contains the section of Fernan Creek within the IPNF designated as a primary riparian area. MA-16 lands include the most important fisheries streams in the IPNF, and are managed with the goal of featuring riparian-dependent resources while producing other resource outputs at levels compatible with the objectives for dependent resources. New road construction is limited to circumstances where no reasonable, environmentally sound alternative exists, as determined by an environmental assessment.

Environmental Consequences

Direct Impacts

Fernan Lake Road is currently located on an 18.3-m (60-ft) wide easement that for the most part overlays existing private lots along the route. The FS holds most of the easement except for a small portion held by ESHD in Segment 2. If a build alternative is selected, the easement would be widened to accommodate the new road and adjacent areas disturbed during construction. Direct, long-term land use impacts from the project would result from acquisition of easements from adjacent properties or from improvements requiring changes in the location of access points to adjacent properties. Direct, short-term impacts would result from construction and associated temporary easements.

Alternative E and Preferred Alternative G

Long-term land use impacts under Alternative E and Preferred Alternative G would consist of permanent easement acquisitions from adjacent properties to accommodate road widening in Segments 1 and 2. No setbacks would be affected because property lines would not change. However, where homes or other structures are present, the distance of those structures from Fernan Lake Road would be reduced by the distance the road would be widened, with reductions ranging from 0.6 m to 3.0 m (2 to 10 ft). One vacant parcel (Parcel 28, Gray, MP 0.9) might be acquired outright as a result of conflicting ROW needs between its driveway access and the new roadway. No displacement of residents or businesses would occur. Property owners would be compensated for easements and access points would be rebuilt where necessary. No substantial, unavoidable, adverse impacts would occur under these alternatives.

Segment 1

In Segment 1, proposed ROW easements would affect 39 parcels but would not displace any structures. There are eight (8) vacant parcels between MP 0.0 and MP 2.2. Easements would not reduce the size of parcels and so would not affect compliance with existing parcel size regulations. Easements on these parcels would fall on steep slopes, and no impacts on future uses of the parcels would be expected. All existing access points would be retained or rebuilt.

None of the long-term impacts to Segment 1 residences under Alternatives E or G is considered to be significant. No accesses would be closed, no residents displaced, and no impacts on parcel sizes would occur. The impacts of Alternative E and Preferred Alternative G are similar. In addition, Alternative E proposes a new bridge in the location of the original bridge at Lilypad Bay.

Segment 2

Alternative E and Preferred Alternative G proposed ROW easements in Segment 2 would affect fifteen (15) parcels but would not displace any structures. There are three (3) vacant parcels between MP 2.2 and MP 5.0. Fourteen (14) driveways to Fernan Lake Road would be reconstructed. Additional ROW would be required east of the road from MP 2.8 to MP 3.0 and from MP 3.6 to MP 3.9 for proposed realignment and restoration of Fernan Creek (Figures 3-11c and 3-11d).

Segment 3
Segment 3 begins at the IPNF boundary (MP 5.0). There are no proposed improvements outside the existing ROW in Segment 3. The road would be rehabilitated but maintain its existing width of 7.8 m (28 ft). Rehabilitation would include repairing slump areas and resurfacing the roadway. These minor improvements would not affect land uses or management goals along this segment of Fernan Lake Road.

Alternative Fm

Alternative Fm would shift the roadway inland between MP 1.0 and MP 2.1, away from the lake edge, and re-route it across three parcels. A bridge over Lilypad Bay would not be required because the road would be moved to the upland area north of the bay. In Segments 2 and 3, the alignment of the road would be essentially the same as under Alternative E and Preferred Alternative G. Consequently, the main difference in land use impacts between Alternative E and Preferred Alternative G; versus Alternative Fm would be seen in Segment 1, between MP 1.0 and MP 2.1.

Segment 1
Alternative Fm would affect 40 parcels in Segment 1. The rear portions of 14 parcels fronting Fernan Terrace Drive–eight with residences–would be affected.

From parcels fronting Fernan Hill Road an additional 119 to 1,100 m^2 (4,305 to 11,840 ft^2) of easement would be required for the additional slope disturbance expected as a result of keeping road improvements away from the lake. Seven parcels with residences fronting Fernan Lake Road between MP 0.85 and MP 1.45 would be affected.

No Action Alternative

Under the No Action Alternative, the roadway would remain in its present condition and size. No additional ROW would be required for road widening and no changes would be made to access driveways. Adjacent lots would not be impacted by acquisition of easements. Access driveways would not be realigned to correct sight distance problems and improve safety. Traffic safety conditions could worsen over time, and the potential for accidents could increase as traffic volumes increase.

Indirect Impacts

An indirect land use impact is one that is caused by, but extends beyond, the direct impacts of a project. Indirect land use and development changes can arise when a project creates or otherwise induces changes in use of adjacent or nearby land. Evaluations of indirect land use effects normally focus on increases in land use intensity, although the opposite can occur when a project is seen to have negative impacts.

Alternative E and Preferred Alternative G
Alternative E and Preferred Alternative G would improve safety for travelers and access to Fernan Lake and FS lands to the north. None of these alternatives are expected to have a substantial effect–either an increase or a decrease–on the level or pattern of development in surrounding areas that would use the road as a primary access route. The majority of the area is zoned for residential or rural uses and would likely remain in the

same use. However, improvement of the road may result in development occurring sooner than would otherwise occur.

While Alternative E and Preferred Alternative G would improve safety and access, they would not necessarily increase traffic along the road nor would they open any new land for development. Fernan Lake Road is already used by local residents, fishing enthusiasts, boaters, hunters, and logging operations. According to the *Fernan Lake Road Traffic Report* (DEA, 2003), volumes on all three segments of Fernan Lake Road are not expected to increase any faster than the county's population (2.5 percent annually). This growth would likely occur with or without the proposed road improvements.

Alternative Fm

Indirect impacts from Alternative Fm would be similar to those from Alternative E and Preferred Alternative G, with the exception of three parcels in the relocated portion of the roadway. At least two of the parcels could be subdivided to create new parcels with direct access to Fernan Lake Road. While the parcels could be subdivided under current zoning regulations, the property owners would have to bear the entire cost of providing road access to the new parcels. Therefore, construction of access under Alternative Fm could induce development on these parcels sooner than would otherwise occur. Likewise, if the property owners elected, several additional homes could be built on the parcels along the abandoned ROW easement as long as county zoning and subdivision requirements (including water and sewage disposal) were met. Potential impacts from the development of additional parcels would not be substantial in terms of overall land use or traffic impacts through the corridor.

No Action Alternative

No significant indirect impacts are associated with the No Action Alternative. Under this alternative, transportation facilities within the project area would remain substantially unchanged. While this might create problems within the project area such as continued accidents and worsening erosion of slopes adjacent to the roadway, it would create neither an increase nor a decrease in the amount or rate of development that occurs on land within or near the project area.

Cumulative Impacts

Cumulative impacts are the sum of impacts to a resource resulting from individual projects or actions. While the impact of each project may not be significant, when combined with impacts of other projects or actions the overall effect may be significant. In assessing cumulative impacts, city and county planners were contacted to identify current or proposed land use actions along or near Fernan Lake Road. No public or private projects are currently proposed in the immediate area. The only project potentially affecting the area would be plans by the FS to close a number of smaller roads within the IPNF. These roads are not connected to Fernan Lake Road but are nearby. A traffic analysis of the project area (DEA, 2003a) has determined that those road closures could increase traffic along Fernan Lake Road, but that the increase would not be substantial and would not increase at a rate greater than the county's projected population growth rate of 2.5 percent annually (Kootenai County, 1998).

Consistency with Local and Regional Plans

Coeur d'Alene Comprehensive Plan, 1995

Land on the north side of Fernan Lake Road from Lakeview Drive/Fernan Court to approximately MP 0.7 is within the city limits of Coeur d'Alene. Development on those parcels is therefore subject to the City's Comprehensive Plan, which designates the parcels as Urban Reserve. Although the Fernan Lake Road ROW is outside the city limits, the Comprehensive Plan was consulted to ensure that widening of the ROW onto city parcels would not be inconsistent with policies applicable to those parcels. In addition, the project area directly adjacent to Fernan Lake is within the Area of City Impact as designated by Kootenai County. This designation allows the county to apply city ordinances to development within the area. The plan map identifies the residential area at the west end of the project area as the Fernan Hill Urban Reserve area. Parcel sizes are typically 0.4 ha (1 ac) or larger. Natural resources goals applicable to the project include protection of surface water quality and maintenance of natural vegetative cover (Goal 4, Policies 2, 3, 5, 6, 11, 12, 13, 19; Goal 5, Policy 3; and Goal 6, Policy 4).

All Build Alternatives

Since all build alternatives are in the Area of City Impact, Segment 1 under all build alternatives are subject to the goals and policies of the Coeur d'Alene Comprehensive Plan. All build alternatives would be consistent with the transportation goal of providing safe transportation, since safety problems would be corrected. All build alternatives would be consistent with the natural resource goals of the Comprehensive Plan in the long run because the proposed project would result in better stormwater management and reduce road-related contamination into the lake, thereby improving the lake's water quality, although clearing and construction would cause a temporary loss of vegetative cover.

The project would not alter the residential character of the Fernan Hill neighborhood, because the road would be widened by acquiring easements from the rear of adjoining parcels and these easements would primarily cover unbuildable areas on steep slopes. Alternatives Fm would improve access to three large parcels that could be subdivided. As a result, development of this land might occur sooner than would occur otherwise. However, access to the new road would not be from the Fernan Hill neighborhood. The project would not attract more traffic, but would make using the road for the same purposes more safe. The project would not change the shape or size of any of the adjacent parcels.

No Action Alternative

The No Action Alternative would be inconsistent with the transportation goal of providing safe transportation, since there are safety problems on the existing road. It would also be inconsistent with the natural resources goal of protecting surface water quality since the erosion and drainage problems next to Fernan Lake would not be fixed. The No Action Alternative would not alter the residential character of the Fernan Hill neighborhood, as existing land use would be expected to continue. It would be consistent with city land use goals.

Fernan Lake Village Comprehensive Plan

Fernan Lake Village lies adjacent to project area between MP 0.0 and MP 0.1. Land uses within Fernan Lake Village are governed by the Fernan Lake Village Comprehensive Plan. Fernan Lake Village is in the process of amending and updating the Comprehensive Plan and Zoning Ordinance. Current policies reserve the village for residential use and mandate protection of lake water quality and lake access. All build alternatives would be consistent with these policies.

Fernan Lake Watershed Management Plan

The City of Fernan Lake Village distributed a draft management plan for the Fernan watershed in November 2003 (FLWTAC, 2003). The plan summarized existing information about the watershed, reported results of water quality sampling in 2003, and presented an action plan in eight categories. Most of the goals aim to reduce sediment and nutrient loading to Fernan Lake. Two management actions specific to Fernan Lake Road are to adopt the recommendations of the Fernan Conservation and Recreation Association on rebuilding and improving the road, and to establish it as a scenic byway. Many recommendations would be most appropriately considered during final road design.

Kootenai County Comprehensive Plan

The Kootenai County Comprehensive Plan governs land uses on unincorporated land that is not National Forest land. Most of the land along Segments 1 and 2 is governed by Kootenai County.

All Build Alternatives

None of the build alternatives would significantly affect land uses in the project area, except on Parcel 28 (Gray, MP 0.8) which would largely be used for road easement and for reconfigured driveway access to adjacent parcels. The parcel is currently vacant and could not be developed under any of the build alternatives. The owner might be able to continue using the land for summer camping.

The proposed project would not generate traffic or provide access to undeveloped land that does not already have access, although Alternative Fm would improve access to several parcels. Since road widening would occur in easements acquired from adjacent parcels, the shape and size of parcels would not be altered by either alternative. However, Alternative Fm would result in the re-routing of a public road through the middle portions of three parcels that currently have frontage on Fernan Lake Road. All build alternatives are consistent with Kootenai County goals and policies because the proposed project would improve storm drainage along the roadway, repair unstable slopes to reduce erosion into the lake, and stabilize riparian habitat next to the lake.

All build alternatives would remove approximately 3,000 m^2 (32,291 ft^2) of fill in the lake across Lilypad Bay, and Alternative Fm would reroute the road away from the lake, reducing the potential for road-related contamination of lake waters. Alternatives E and

G would cross Lilypad Bay with a new bridge. The project would not encourage incompatible uses along the roadway, but would enhance safety and movement of people and goods. The pullout areas would enhance access to the waterfront.

No Action Alternative
The No Action Alternative is consistent with existing land use goals and policies but is not consistent with some of the goals and policies relating to water quality and vegetation protection, vehicular safety, and movement of goods and people, because existing adverse impacts on the lake from impaired drainages and unstable slopes would not be remedied, safety problems would remain. Prohibition of trucks on the road during the spring and fall freeze-thaw periods would continue affecting timing for timber harvesting in the IPNF.

IPNF Forest Plan
The Forest Plan guides all natural resource management activities and establishes management standards for the IPNF, including all land within Segment 3 of the project area. The Forest Plan describes resource management practices, levels of resource production and management, and the availability and suitability of lands for resource management, and contains forest-wide management direction (goals, objectives, and standards for individual forest resources) and Management Area direction for geographical areas. Fernan Lake Road crosses Management Areas 1, 4, 9, and 16.

All Build Alternatives
All Management Areas adjacent to Segment 3 have road management goals that limit road construction where feasible. All build alternatives would be consistent with Forest Plan policy direction in Segment 3, where only repaving and repair of minor slump areas would occur, and all work would occur within existing ROW. Resurfacing of the road would be sufficient to support the projected level of demand for access to the Forest while having the least impact on surrounding natural areas. Therefore, the alternatives meet the standards of providing for demand while protecting wildlife habitat. Where culverts would be impacted by construction in Segment 3, they would be replaced or relined in compliance with the goal of MA-16, if required.

No Action Alternative
The No Action Alternative would be less consistent with Forest Plan policy direction and management area goals because truck use of Segments 1 and 2 would be restricted during spring and fall freeze-thaw periods. Therefore, the road would not meet identified needs. No culverts would be replaced or relined, so this alternative would comply less with the MA-16 goals for Management Area 16.

Recommended Mitigation Measures

The main impacts under the build alternatives would result from ROW easement acquisition. Mitigation in the form of financial compensation to property owners is provided for under federal law. If Parcel 28 (Gray, MP 0.8) were acquired outright, the property owner would be compensated. Since a portion of the parcel might be available following construction, mitigation could be in the form of an agreement by ESHD to allow the property owner to continue to park a recreational vehicle on the parcel during summer.

No mitigation other than ROW compensation would be available for parcels that are or would become non-conforming in size. However, all of these parcels would still be able to develop one single-family home, as currently.

Impacts on access to existing parcels were identified and remedied in the design of all build alternatives; therefore, no additional mitigation measures would be needed or recommended for driveways. In some cases, designs were changed to improve safety for vehicles entering and exiting Fernan Lake Road. Further design development could alter the impacts but not substantially.

With respect to setbacks, impacts on the few existing non-conforming setbacks from the new ROW easement were limited wherever possible by keeping the same easement line or in one case (Parcel 57, Eddy) moving the line farther from the structure to make the setback relatively more conforming.

Mitigation for construction impacts on local land uses and access points would consist of the following:

1. Traffic management efforts would be coordinated with local residents and recreational organizations such as the Fernan Rod and Gun Club, the snowmobile and ATV clubs, and other fishing and hunting clubs, to ensure their notification prior to and during all construction activities.

2. Up-to-date information on construction schedules, anticipated delays, and locations would be supplied to emergency service providers. The contractor would be required to provide immediate passage through the construction area for all emergency service vehicles.

3. For road closures or delays longer than 30 minutes, public notice would be given in advance through the local news media and by information signs. Road closures of up to 4 hours might be needed during construction along the lake.

4. The contractor would use only approved portions of the ROW for storing material and placing equipment and would not use private property for storage without written permission of the property owner.

5. Construction would be phased over two or more years. At the end of the construction season, all exposed ground would be covered or planted to protect it from erosion during winter.

References

DEA. (David Evans and Associates, Inc.). 2003a. *Fernan Lake Road Safety Improvement Project: Traffic Report.*

IPNF Forest Plan (FS, 1987).

Kootenai County. 1998. *Kootenai County Area Transportation Plan (KCATP) 1997–2017,* Coeur d'Alene, Idaho.

3.8 VISUAL QUALITY

FHWA's manual, Visual Impact Assessment for Highway Projects (FHWA, 1981), provides guidance for assessing visual impacts and was used as a basis for analysis of the Fernan Lake Road Safety Improvement Project. The visual impact assessment is consistent with the objectives and process outlined in the manual. Visual quality objectives (VQOs) have been established for the IPNF in accordance with *National Forest Landscape Management* (Chapter 1, "The Visual Management System") (FS, 1974). VQOs were identified for Fernan Lake Road in *Forest Plan, Idaho Panhandle National Forest* (FS, 1987) and used to assess project impacts and to identify mitigation measures.

Affected Environment

The FHWA process involves describing the visual character and visual quality of the area that a road project travels through as well as identifying viewer exposure and viewer sensitivity. The process leads to an understanding of the visual resource and viewer sensitivity to changes in the view. Visual impacts and appropriate mitigation can be identified based on this understanding.

Visual Character and Visual Quality

The Fernan Lake Road viewshed, or area that can be seen from the road and from which the road can be seen, is shown in Figure 3-12. Within this viewshed, Fernan Lake Road passes through four distinct Landscape Units that correspond to visual assessment units in this analysis. Landscape Units are "outdoor rooms" that are delineated by geographic location and distinct landscape character. Figure 3-12 also shows the Landscape Units.

Existing visual conditions and potential impacts of the proposed project are described in terms of the visual character and quality of each Landscape Unit. Visual character is comprised of four pattern elements (form, line, color, and texture) and four pattern characteristics (dominance, scale, diversity, and continuity). Visual quality is evaluated on these three attributes:

- **Vividness,** the memorability of the visual impression received from the contrasting landscape elements as they combine to form a striking and distinctive visual pattern. An example of a landscape with a high level of vividness is a flat plain with a high peak rising from it.

- **Intactness,** the integrity of visual order in the natural and man-built landscape, and the extent to which the landscape is free from visual encroachment. An example of a landscape with a high level of intactness is a prairie meadow.

- **Unity**, the degree to which the visual resources of the landscape join together to form a coherent, harmonious, visual pattern. Unity refers to the compositional harmony or the inter-compatibility between landscape elements.

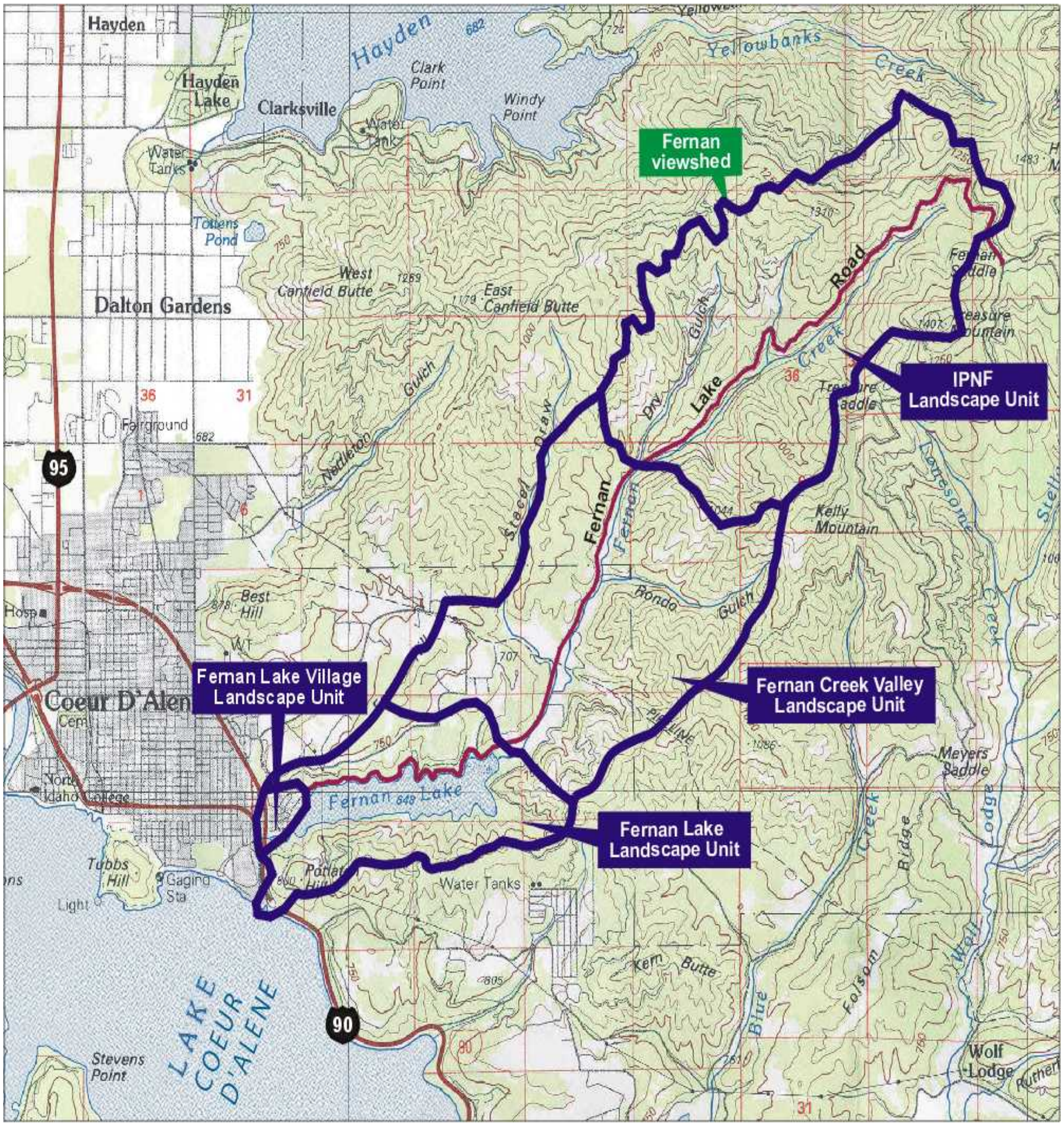


Figure 3-12. Fernan Viewshed and Landscape Units.

Viewer Exposure and Sensitivity

Visual impacts of a project depend on the viewers' expectations and degree of sensitivity, which have been shown to vary by location. Residents, travelers on the roadway, and recreational users are some of the types of viewers that would be affected by the Fernan Lake Road project.

Viewer exposure is defined as the degree to which viewers are exposed to a view by their physical location, the numbers of people viewing, and the duration and frequency of the view. Viewer sensitivity is defined as the degree to which viewers are likely to be receptive to the visual details, character, and quality of the surrounding landscape. Two principal factors affect viewer sensitivity: the type of activity in which the viewers are engaged (e.g., recreational use vs. commuting) and level of awareness of the viewers (e.g., cultural significance of a resource or expectations about the setting).

Forest Service Guidance

The FS handbook, Landscape Aesthetics: A Handbook for Scenery Management (FS, 1995), contains guidance for evaluating project impacts on National Forest lands. Half of the Fernan Lake Road project (MP 5.0 to MP 10.7) is located on National Forest lands (Segment 3), and the FS holds an easement for the remainder (MP 0.0 to MP 5.0, Segments 1 and 2) except for 0.8 km (0.5 mi) that is held by ESHD. The handbook defines the Scenery Management System for the inventory and analysis of aesthetic values of National Forest lands. Forest lands are mapped using Landscape Values, which represent the inventory of scenic attributes and their related social values. The components of Landscape Values are described in Table 3-12**.**

Table 3-12. Forest Service Landscape Values

Component	Description/FHWA equivalent
Distance Zone	Distance from an observer.
Sensitivity Level	Public’s concern for scenic quality expressed as level 1, 2, or 3 (corresponds approximately to FHWA’s definition of viewer sensitivity). Sensitivity levels are determined for land areas viewed by those who are traveling on developed roads and trails, living along or across from the project area, using developed recreation sites, or recreating at water bodies.
Variety Class	The diversity of natural features (corresponds approximately to FHWA’s definition of visual character pattern elements).
Quality Objective	Measurable standards for land management (corresponds approximately to FHWA’s definitions for intactness, vividness, and unity).

Source: FS, 1995

Existing Conditions

Landscape Units

The project area Landscape Units are based on divisions created by natural topographic features and by changes in the character of the landscape and type of human use. Fernan Lake and the Fernan Creek valley are the most defining natural features in the area. As shown in Figure 3-12, the project area is divided into four distinct Landscape Units:

- Fernan Lake Village;
- Fernan Lake;
- Fernan Creek Valley (from Fernan Lake to the IPNF boundary); and

- IPNF (from the IPNF boundary to Fernan Saddle).

Fernan Lake Village was selected as a Landscape Unit because it is characterized by urban residential and recreational uses. Fernan Lake and the slopes immediately surrounding it were selected as a distinct Landscape Unit (Fernan Lake Landscape Unit). The valley from the lake to the gun club was selected because of its distinctive natural features and predominantly agricultural character (Fernan Creek Valley Landscape Unit). The project area northeast of the gun club is forested and undeveloped (IPNF Landscape Unit). Representative viewpoints were selected for each Landscape Unit by DEA in consultation with the FS.

Fernan Lake Village Landscape Unit

This small residential community is surrounded by steep slopes dominated by mature ponderosa pine with some understory shrubs and grasses. The residential area contains a mixture of deciduous and evergreen ornamental and native plantings. Most of the houses visible from the road are single-family, one-story, contemporary ranch-style structures. Views of and from the residences and driveways are obscured by the close-in vegetation surrounding the houses. The lake is visible from homes along Lakeview Drive and Fernan Terrace Drive.

The trees and shrubs interspersed with the houses provide a diversity of texture and horizontal and vertical lines. Therefore, there is a moderate degree[2] of vividness. Natural features have been disturbed, but the landscaping does contribute to a moderate degree of intactness. No single element or feature dominates the small-scale development with the compatible houses and landscaping. The result is a moderate degree of unity.

Two viewpoints were identified in this Landscape Unit. Figure 3-13 shows the location and orientation of the viewpoints.

<u>Viewpoint #1 (just west of MP 0.0, intersection of Lakeview, Fernan Street, and Fernan Lake Road)</u>

This viewpoint is on Fernan Street in Fernan Lake Village looking toward the lake. The homes fronting the lake are shown, but the lake itself is not visible. While the homes along the lake front have a view of the existing road and would see project impacts for most of the distance around the lake, most residents of Fernan Lake Village do not have a view of the road nor would they have a view of project impacts. The lakeshore homes and landscaping obscure the view.

Viewpoint #1 looks east at MP 0.0, the beginning of the proposed project.

[2]"Moderate degree" indicates something apparent to a casual viewer in proximity.

Visual Assessment

Viewpoint #2 looks north at MP 0.1, where road widening would begin.

<u>Viewpoint #2 (near MP 0.1, start of road widening)</u>

This point is where road widening would begin, just east of Fernan Street, from the intersection of Lakeshore Drive and Fernan Lake Road looking east along the road. Project impacts would clearly be visible from this point.

Fernan Lake Landscape Unit

Fernan Lake Road winds along the northern edge of Fernan Lake following the terrain. Long-distance views along the road are obscured by the winding nature of the road alignment. To the north are forested slopes and to the south is the lake. Along the lake, views from the road to the north are obscured by the steep slopes and close-in young conifers. Rocky outcroppings are interspersed among the trees. Grasses and deciduous shrubs as well as power lines and support poles line the roadway. Power lines traverse the lake in several locations, some with aircraft warning globes.

The lake is clearly visible to the south from the road, as there are few obscuring trees. From protruding points on the north side of the lake, Fernan Lake Village is visible to the west. At the eastern end of the lake, there are fewer trees and the marsh and wetland areas are more open. The lake is at its widest here (approximately 0.8 km [0.5 mi]), and there are few trees along the lake side of the road. The road, boat landings, and vehicle pull-outs are clearly visible from the roadway. Several multiple-story houses are clearly visible on the southeastern side of the lake.

This Landscape Unit has high degrees of vividness and unity and a moderate degree of intactness. The lake and surrounding tree-covered slopes are contrasting elements in terms of form, line, color, and texture, creating a striking visual pattern (vividness). The lake and surrounding hills are visually compatible in terms of scale and dominance, providing views of a coherent lake environment (unity). The houses both south and north of the lake, Fernan Lake Road itself, and the power lines encroach into the visual order created by the lake and wooded slopes.

Six viewpoints (#3–8) were identified within this Landscape Unit.

Viewpoint #3 looks north toward MP 1.1.

Viewpoint #3 (near MP 1.1, bay)

This point, from the road adjacent to the sheltered bay at the Moate property, is a good representation of the ponderosa pine habitat that frames views of the lake and wooded slopes beyond.

Viewpoint #4 (near MP 2.2, east Fernan Lake boat dock)

This point is from the boat dock at the east end of Fernan Lake looking west over the lake, showing the overall setting for the lake and road. In this area, there are fewer mature trees and the lower-growing vegetation permits expansive views.

Viewpoint #4 looks west across Lilypad Bay and open water from the East Fernan Boat Launch.

Viewpoint #5 (on Fernan Lake)

This point is from a boat in the middle of Fernan Lake looking north at the road. This view shows that the road is clearly visible from all points on the lake and that there is little vegetation (other than trees) between the road and the lake**.**

Viewpoint #6 (Potlatch Hill)

This point is from a vacant lot adjacent to the residences on Potlatch Hill looking north at the lake and road. The boat docks of homes in Fernan Lake Village are on the left in the photograph, and Fernan Lake Road is clearly visible along the edge of the lake.

Viewpoint #7 (Fernan Terrace Drive)

This point is from the residences on Fernan Terrace Drive looking southeast toward the lake and road. Portions of the road are visible, but the slopes obscure much of its length. The lake is clearly visible through the mature trees.

Viewpoint #8 (near MP 0.3)
From this point, the narrow, winding character of the road and the mature trees that line it are clearly visible. The proximity of homes to the road is also shown.

Viewpoint #8 looks north along the road from MP 0.3.

Fernan Creek Valley Landscape Unit (from Fernan Lake to IPNF Boundary)
The character of this segment of the proposed project differs from that of the road along the lake and therefore, this is considered a separate Landscape Unit. In this unit, the roadway runs through a flat valley, varying in width from less than one-quarter-mile- to more than one-mile-wide at Stacel Draw. Rather than the winding roadway along the lake, in this segment the roadway runs fairly straight up the north side of the valley. Immediately adjacent to the road are Fernan Creek, low wooden fences, low grasses, and both exotic and native deciduous trees.

On either side of the valley are rounded hills covered with even-aged conifers. There is no apparent understory vegetation; the ground is visible between the trees. Structures are generally located on the valley floor and include houses, barns, and other rural residential and agricultural facilities. The contrast in form, color, and texture between the narrow agricultural valley and the surrounding forested hills creates a high degree of vividness. This Landscape Unit also has high degrees of intactness and unity. There is little encroachment into the natural and agricultural setting. The flat valley floor and forested peaks form a cohesive pattern. There are power lines and support poles along the north side of the road.

Viewpoint #9 looks east across the Fernan Creek Valley near MP 3.05.

Viewpoint #9 (near MP 3.4)
This point is from Fernan Lake Road looking west across the valley at Stacel Draw. In this area the valley is widest and the agricultural nature is clear.

Viewpoint #10 (near MP 3.4)
This point is from Fernan Lake Road looking north toward IPNF near where the natural gas transmission pipeline crosses the road. The straight alignment of this segment of the road and the lower growing, largely deciduous nature of the roadside vegetation is visible.

IPNF Landscape Unit (from IPNF Boundary to Fernan Saddle)
In this Landscape Unit, the valley narrows significantly and the road begins to climb from the valley floor to Fernan Saddle. The roadway winds along the northern slopes

above the creek. The landscape is uniformly comprised of conifer-covered slopes, and as a result has a high degree of unity. The steep drop to Fernan Creek from Kelly Mountain and Treasure Mountain provides some degree of contrast, resulting in a moderate degree of vividness. There is a high degree of intactness–the only visual encroachment on the forested setting is the roadway, some areas where timber has been recently cut and talus slopes.

Two viewpoints were identified for this Landscape Unit.

Viewpoint #11 (near MP 5.0 and the IPNF boundary)

This point is from the road near the National Forest boundary looking north with the public shooting sites to the right and the Canfield Mountain trailhead to the left. The narrowing valley and forested slopes are clearly visible. This is one of the few places where a visual encroachment on the forested setting is visible.

Viewpoint #11 looks east along near the Forest Service Boundary.

Viewpoint #12 (near MP 7.5, in the IPNF)

This point is from the road in the area between BM 2364 and 3845 (approximately MP 7.5, looking south toward Fernan Lake). The steep, forested slopes and winding nature of the road are clearly shown.

Viewpoint #12 looks southwestward down the road from near MP 7.5 within IPNF.

Viewers

Residents

The three main residential areas are Fernan Lake Village on the west side of Fernan Lake (including Fernan Terrace Drive above the lake), homes along Fernan Lake Road (mostly on the north side of the road) and homes to the south of the lake on Potlatch Hill. These areas are comprised primarily of single-family residences. The residents along Lakeview Drive in Fernan Lake Village and on Fernan Terrace Drive tend to have landscaping surrounding their homes that physically limits their view of the road or lake. However, views can be considered permanent and residents are exposed to road views daily. The residents of Fernan Lake Village likely expect a suburban residential setting with houses nearby as well as landscaping and views of Fernan Lake.

Travelers

People in vehicles traveling along Fernan Lake Road are the primary traveler viewers of the project area. (Commuters traveling on I-90 west of the project area were not considered in this study because safety railings obscure the view. Also, the viewers' exposure is low due to the 105 km/h [65-mph] speed limit, i.e., at faster speeds, viewing time is shorter.) Viewer sensitivity is high for most travelers on Fernan Lake Road because they are recreational users driving to and from dispersed (camping, hiking, hunting in the IPNF) and developed (Fernan Lake, trail heads, Fernan Rod and Gun Club) areas.

Recreational Users

Recreational users are concentrated in three areas: Fernan Lake Village, which contains a boat ramp and associated fishing docks at Fernan Park, Fernan Lake itself, and Fernan Lake Road, which provides access to the lake for bank fishing. The remaining portion of Fernan Lake Road, which ends at Fernan Saddle, provides access to various recreational facilities, but few are located adjacent to the road. Viewer exposure is typically long at recreational sites, and viewer sensitivity is high because users expect to experience a natural setting both at the lake and in the forest.

Environmental Consequences

Direct, Long-Term Impacts

The build alternatives generally make substantial use of the existing Fernan Lake Road alignment with some noted exceptions and would reconstruct the road to a uniform width and add drainage/rockfall ditches along the side. To do this, vegetation would be removed and the hillside cut into.

Fernan Lake Village and Fernan Lake Landscape Units

The proposed alternative alignments would introduce several elements into the viewed area. Specific design details would be developed in the next phase of the project, but it appears that road cut slopes, some as large as 20-m (66-ft) high would be needed to widen the road. These cuts would be larger and more evident until replanted vegetation matured.

Retaining walls would be constructed where space or existing topography limits slope easing adjacent to the roadway. The total length of retaining walls varies by alternative, from 860 m (2,822 ft) in Preferred Alternative G to 1,530 m (5,020 ft) in Alternative Fm. Retaining walls constructed along the lakeside of the roadway would reach up to 4.5-m (15-ft) high.

Guardrails would be incorporated along the roadway under all build alternatives as necessary for safety purposes. The total length of guardrail varies by alternative from 760 m (2,493 ft) in Preferred Alternative G to 1,000 m (3,510 ft) in Alternative Fm.

In all build alternatives, existing wood and metal culverts would be replaced with new metal or concrete culverts.

In Alternative E, a new bridge would also be constructed. This bridge would be more linear in design than the Preferred Alternative G bridge design and follow a different alignment, pushing the bridge further south over open water in Lilypad Bay. The existing road causeway would be removed under this alternative.

Alternative Fm also follows an alignment to the north and uphill from the lakeshore. This alternative follows the terrain farther uphill, and introduces more curves to aid in reducing traffic speeds. Alternative Fm crosses the Lilypad Bay wetland north of the existing causeway. To maintain safe road grades, however, the roadway would be located on a very tall fill slope, roughly 15.2 m (50 ft) high. This immense fill slope would totally cut off adjacent homeowners' lake views. The fill slope would drastically impact views from the homeowners' property, eliminating views of the lake and surrounding vegetation and substituting that with views of the giant fill slope in the immediate foreground looming over the property. The existing road and causeway crossing Lilypad Bay would be removed.

Preferred Alternative G generally follows the existing Fernan Lake Road alignment throughout Segment 1. Near Lilypad Bay, a curved bridge would be located just north of the existing road. The existing causeway and road would be removed.

Under all build alternatives, the new elements would not be visible to residential viewers in the Fernan Lake Village area, except for those immediately south of the beginning of the project. Three homes right on the lakeshore would see new road cut slopes and a short run of guardrail. Potlatch Hill residents would see some cut slopes as middle ground. Topography and existing vegetation screen much of the roadway from residents of Fernan Terrace. Some of the mature trees would be removed, altering the view until replanted vegetation matured, which could take 10 to 20 years. The various Lilypad Bay bridge structures in the different alternatives would be visible only from the lake, the immediate vicinity on the road, and to nearby homeowners.

Travelers' View

Travelers on Fernan Lake Road would see the wider, more uniform but still winding road. New cut slopes to the north and guardrails would dominate the immediate foreground. Sections of retaining wall would be visible in places along the roadway. However, replanted vegetation would partially screen the walls. Culverts would probably not be visible from the road due to topography but would be visible from the lake. The new bridge in Alternative E and Preferred Alternative G would be a dominant visual foreground element but of limited viewing duration. The large fill slope crossing the head of Lilypad Bay in Alternative Fm also would be a dominant visual element but of limited viewing duration for drivers. Lake users and nearby homeowners would have views of longer, or even static, duration.

By moving the road away from the lake, as in Alternative Fm, travelers' views would be substantially changed for half of the distance in Segment 1 (the Fernan Lake Landscape Unit).

Lake Users' Views
In all build alternatives, recreational users in the Fernan Lake Village boat ramp and fishing docks area would see some portions of new guardrail in middle ground views or views from a distance of 0.8 km (0.5 mi) to 4.8 km (3 mi). Culverts would not be visible. Users on the lake itself would see cut and fill slopes, guardrails and culverts in foreground to middle ground. Installation of new guardrails and culverts would also constitute significant visual impacts for viewers from the lake due to their proximity to the roadway and lake edge, which is where most of the users are. Retaining walls, located above lake users' perspective and only partially screened in some locations by existing vegetation, would be visible, mostly in the middle ground.

In Alternative E, the new bridge, although it would be located farther south in Lilypad Bay than the other bridge alternative, also would be a dominant foreground element but only to the lake users and drivers in the vicinity of Lilypad Bay. The bridge would appear as a smaller-scale element to viewers in the middle and background positions from across the lake.

In Alternative Fm, the existing road and fill crossing at Lilypad Bay would be removed, allowing views further up to the head of Lilypad Bay from the east end of the lake. The most significant impact would be from road cut and fill slopes, especially the very tall fill slope of the alignment as it crosses the head of Lilypad Bay. Due to the light color of the native rock and soil any road cut or fill slope would contrast markedly with surrounding dark colored coniferous vegetation until replanted areas matured. The visual impact of the retaining walls would be significant as well, unless existing vegetation between the road and the lake is retained to screen them from lake user views. If the vegetation, for any reason, were thinned or removed, the walls would become a highly contrasting form in the landscape.

In Preferred Alternative G, the new bridge would be a dominant foreground element but only to the lake users and drivers in the vicinity of Lilypad Bay. The bridge would appear as a smaller-scale element to viewers in the middle and background positions from across the lake.

With appropriate mitigation measures, the direct long-term impacts for Segment 1, with important exceptions, would not change the Visual Quality Landscape Values. The VQO for the Fernan Lake Landscape Unit is R, Retention, where built elements in the landscape are allowed but must repeat form, line, color, texture, and pattern common to the visual character of the existing viewed landscape so completely that they are not visually evident. The tall road fill slopes in Alternatives D and Fm would not meet the Retention visual quality objective. The form, color and line of these large fill slopes would be quite different from the surrounding contextual visual character.

Visual Changes by Viewpoint

Viewpoint #1 (just west of MP 0.0, intersection of Lakeview, Fernan Street, and Fernan Lake Road)

All Build Alternatives

Topography and lake front homes block views of the project from this location. There would be no change in view as a result of road construction.

Viewpoint #2 (near MP 0.1, start of road widening)

All Build Alternatives

Project road cut slopes would be highly visible to a traveler on the road. Removal of existing mature conifers and the high-contrast cut slope surface would create a significant impact. Removal of roadside vegetation at the lake edge would open up lake views of longer duration. The road itself would be wider with a defined edge.

Viewpoint #3 (near MP 1.1, bay)

Alternative E and Preferred Alternative G

Due to the residential structures here, the road alignment would be pushed slightly away from the lake. This would allow most of the existing mature vegetation on the lake edge to remain intact and would continue to screen views from the road towards the lake. On the north side of the road, cut slopes would be highly visible to travelers and residents. The cut slopes would be the foreground focal point as drivers traveled around this road curve. Removal of existing vegetation plus the creation of high-contrast cut slopes would create significant visual impacts for travelers.

Alternative Fm

Near this viewpoint, this alignment would leave the existing road corridor and push farther away from the lake and residential structures and head up the hillside. Tall fill slopes would be obvious in the foreground as the alignments traverse the drainage north of the residential buildings near MP 1.1. Guardrail on the south side of the alignment would be another strong linear foreground visual element along this curved portion of the roadway. Removal of mature conifers in this area would create additional exposure of the fill slopes.

Viewpoint #4 (near MP 2.2, east Fernan Lake boat dock)

Preferred Alternative G

At this location, the roadway alignment would be pushed farther into the hillside to provide a uniform curve radius, which is safer. This would create a very large (16-m [53-ft] high) and steep cut slope. This slope, with its lack of vegetation and high-color contrast, would be highly visible from locations both from the roadway and on the lake. It would constitute a significant visual impact. The parking area itself would be in the immediate foreground and would create a visual terminus for drivers approaching this curve. Parked vehicles in this lot would further interfere with lake views for travelers and would also be very visible from the lake unless landscaping were installed to screen the views. The proposed curvilinear bridge would become a dominant foreground visual element. Context-sensitive design of a new bridge coupled with the removal of the existing road causeway would open up views of the Lilypad Bay wetlands area from the roadway and from the proposed nearby vehicle parking areas.

Alternative E

Visual changes under this alternative would be similar to those listed above in Preferred Alternative G with the exception of the proposed bridge layout. This alternative's bridge design would be located further south of the existing road causeway and near the existing boat dock. This bridge would span the open water of Lilypad Bay. A retaining wall would be located at the west bridge approach and vehicle parking would be sited on both sides of the road at the eastern approach. The bridge itself would be more linear than the curved spans of Preferred Alternative G. Because the bridge is located further south in the bay than in other alternatives, it would be a more dominant foreground visual element to both road and lake users. It would be more visible as a middle ground element to eastbound drivers near MP 1.8 and lake users, although context-sensitive design would lessen the visual impact.

Alternative Fm

Visual changes from viewpoint #4 under this alternative have strong visual impacts due to the large scale of the fill slope crossing the head of Lilypad Bay, 15.2 m (50 ft) high.

<u>Viewpoint #5 (on Fernan Lake)</u>

Alternative E and Preferred Alternative G

The project alignment at this location would create several significant visual impacts. The road cut slopes would be steep and large (almost 10-m [33-ft] high), and a retaining wall (2-m [6.6-ft] high) would be constructed near the water's edge. Perhaps most importantly, the retaining wall location would require the elimination of the few, but highly valuable, mature conifers that help visually screen the road cut slope behind them. The overall effect of these impacts would create a highly visible cut slope/retaining wall view for lake users and possibly even for some Potlatch Hill residents. The impact would be visible to nearly all lake users.

Viewpoint #5 looks north from the lake at the point at MP 1.3.

Alternative Fm

In this alternative, the alignment would be further up the slope and away from the lake shore compared to the previous alternatives. The road surface itself would not be visible to lake users from this perspective due to the users' inferior visual elevation aspect. However, because these designs do not use existing topography to best advantage, the large fill slopes up to 10 m (33 ft) tall necessary for the route would create significant visual impacts. Removal of coniferous trees during construction would expose more of the visually contrasting form, color and texture of these fill slopes. Guardrails along the south edge of the alignment would also create contrasting visual elements from this viewpoint.

Viewpoint #6 (Potlatch Hill)

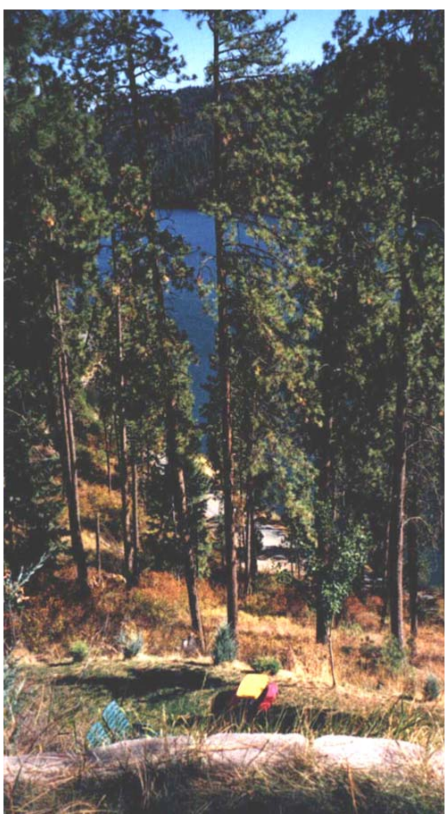
Alternative E and Preferred Alternative G

Residents on the north side of Potlatch Hill would see many of the new road elements from Fernan Lake Village to about MP 1.5 as middle ground and background. However, given the high color contrast of the cut slopes and prominent line that would be created by lakeside retaining walls, the elements would disrupt the unity and vividness of the views.

Viewpoint #6 looks northeastward up Fernan Lake from Potlatch Hill.

Alternative Fm

Visual quality impacts for this alternative would be similar to those stated above with one additional impact. Although this alignment, from roughly MP 1.1 to MP 1.5, climbs up the hill away from the lake shore, the loss of mature coniferous vegetation would make the cut and fill slopes necessitated by this layout visible as contrasting line, texture and color middle ground visual elements.



Viewpoint #7 looks southeastward from Fernan Terrace Drive toward MP 0.4.

Viewpoint #7 (Fernan Terrace Drive)

All Build Alternatives

Topography and vegetation combine to screen most views of the road from this viewpoint. In the short term, until revegetated, new cut and fill slopes would alter the topography and remove vegetation near the road, creating contrasting visual elements. Although views would be directed primarily out over the lake, the roadway and cut and fill slopes would be partially visible. Views from here are stationary and of long duration, providing residents ample opportunity to observe visual impacts.

Viewpoint #8 (near MP 0.3)

All Build Alternatives

Tall (12-m [39-ft]), high-contrast cut slopes, fill slopes, and a tall, lakeside retaining wall would create visual impacts. Lakeside vegetation would be lost to retaining wall construction, opening up views from the road outward to the lake. This would also open up views of the retaining wall, roadway, and cut and fill slopes to lake users, lake front Fernan Lake Village residents, and north-facing Potlatch Hill residents. This change would be significant as residential viewers experience the views for long durations from stationary viewpoints. Most lake users on the east end of Fernan Lake also would be impacted by this view.

Fernan Creek Valley Landscape Unit
All build alternatives make substantial use of the existing Fernan Lake Road alignment throughout this portion of the project. The roadway would be widened from the existing alignment to 7.6 m (25 ft) in Alternatives E, Fm, and Preferred Alternative G. This widening would result in road cut slopes that would be larger and more evident along the roadway ranging up to 4.1 m (13.5 ft) high. Most cut slopes would be in rock, so retaining walls would not be required. Guardrails would be installed along one portion of the road. Existing wood and metal culverts would be replaced with new metal or concrete culverts. The roadway would be raised 1 to 2 m (3 to 7 ft) above existing grade in places. In Alternatives E, Fm, and Preferred Alternative G, the alignment is pushed away from the rock outcrops and wetlands and towards the creek. As a result, portions of the creek would be relocated and the natural meander pattern (destroyed in the creation of adjacent agricultural fields) would be reintroduced.

These new visual elements would be highly visible to roadway travelers. The cut slopes would have more color contrast with their surroundings, at least until revegetation is established. Because of the light color of the soil and rock, the cut and fill slopes would be contrasting visual elements in foreground viewing areas for travelers. New culverts would not be very visible to travelers but might be visible to adjacent homes.

With appropriate mitigation measures, the direct long-term impacts for Segment 2 would not change the Visual Quality Landscape Values.

<u>Viewpoint #9 (near MP 3.4)</u>
All Build Alternatives
The east and west views from this location would not be affected.

<u>Viewpoint #10 (near MP 3.4)</u>
All Build Alternatives
Looking along the road, one would see the roadway itself as a dominant element in the visual landscape. The raised roadbed (1 to 2 m [3 to 7 ft] high) would create highly visible fill slopes flanking the pavement on both sides. Culvert ends in the fill slopes also would have large flared cut ends to better fit the slope angle. Road cut slopes northeast and southwest of this location would also be visible due to removal of vegetation and high color contrast surface, at least until landscaping matured.

Viewpoint #10 looks north along the road from MP 3.05.

IPNF Landscape Unit
This segment lies entirely within the National Forest boundary. In all build alternatives, the road would be rehabilitated only. There would be no proposed improvements that would create significant visual elements.

There are no residential viewers in this segment.

There would be no direct, long-term impacts for Segment 3, and the Visual Quality Landscape Values would not change.

<u>Viewpoint #11 (near MP 5.0 and the IPNF boundary)</u>
All Build Alternatives
As the major road improvements would end at the National Forest boundary, this view would not change.

<u>Viewpoint #12 (near MP 7.5, in the IPNF)</u>
All Build Alternatives
Spot improvements, such as rockfall fences, bank stabilization, or reconstructed ditches as well as roadway surface repairs would occur in relatively short segments at select locations in Segment 3. These improvements would be noticeable in the immediate foreground views and would create moderate visual impacts.

Indirect, Long-Term Impacts

With the completion of this project resulting in an improved, safer roadway, perhaps the most important indirect long-term impact would be creation of designated pull-out areas where travelers could stop to admire the view safely along Fernan Lake and into the National Forest.

Better road access may encourage more development in the area. Most would likely be large lot single family residences similar to those on Fernan Terrace and Potlatch Hill. Overbuilding would lead to a loss of visual character and vividness if the area transitioned from largely undeveloped to largely developed. The coniferous fabric would be broken up with additional "checker boarding" of timbered areas. Agricultural land in the Fernan Lake Valley could also experience additional residential development. More homes would fragment the unity of the agricultural elements present in the valley area.

Cumulative Impacts

There are no other known projects in this area. There are no known cumulative effects.

Short-Term Construction Impacts

These are activities or elements present during the actual construction phase of the project that would have visual impacts. For instance, removal of existing vegetation from road slopes would be the largest construction impact. Loss of mature screening vegetation would expose cut slopes, retaining walls, and other man-built elements to views from the roadway, on the lake, and for residential viewers. Immediate revegetation with shrubs, grasses, and groundcovers would “green up” construction areas in approximately five years. Re-establishment of the forested character of the slopes would take much longer (at least 20 years). Construction equipment also would be highly visible from some residences near the west end of the lake. Users on the lake would also easily notice heavy equipment working or parked near the lakeshore.

Stockpiles of materials, such as crushed rock, soil, or culverts, would impact visual character of the area if the contractor leases private land adjacent to the road for staging. Given the topography of the area, stockpiles and staging areas are unlikely in Segment 1 but could be located in Segment 2. Dust raised by equipment operation would be visible to residential viewers and recreational users if not abated by regular sprinkling.

Mitigation

1. *Road cut slopes.* Adjust final alignment to minimize road cut and fill slopes and retaining walls as much as possible while maintaining safe travel design parameters. Retain existing vegetation between the road and the lake wherever possible. Revegetate with native materials and grass mix compounded specifically for this area as necessary to blend into surroundings. Treat and grade slopes to allow optimum revegetation.
2. *Rock outcrops in road cut slopes.* Stable rock outcrops would be retained where possible. Allow for a natural, broken-faced effect on new cuts, where consistent with geotechnical conditions.
3. *Existing roadbed.* Minimize compaction by ripping and scarifying. Blend the roadway into contours of surrounding terrain as far as possible consistent with safety. Using native materials, revegetate disturbed areas to blend roadway into surroundings.
4. *Guardrails.* Select guardrail materials that complement or blend into the surroundings by utilizing timber or “self-weathering steel” or similar treatment. Consider the use of wire guardrails rather than solid rails to reduce the impact to views from the road along the lake, where consistent with safety.
5. *Culverts*. Treat culvert ends so as to disguise them. Place rock and soil around culvert ends, or apply flat, black paint or other coatings to eliminate the shiny metallic appearance.
6. *Retaining walls*. Construct retaining walls of materials that do not create high color or textural contrast to surroundings. Use curvilinear walls to conform with landforms where possible. Preserve existing vegetation where possible, and enhance by new plantings if necessary, to screen walls from sensitive viewer locations. Creating planting pockets in the retaining walls would break up the massive man-made appearance of larger walls.
7. *Bridge.* Select a bridge type that is as low to the water as possible and utilize low-contrast materials and colors to construct it.
8. *East Fernan boat dock.* Install new plantings to screen parked vehicles from the view of lake users. Preserve existing vegetation where possible.

References

Agencies and Individuals

US Forest Service, Idaho Panhandle National Forests. Jane Houghton, Landscape Architect.

Documents and Personal Communications

FHWA. 1981. Visual Impact Assessment for Highway Projects. Office of Environmental Policy.

FS (US Forest Service). 1974. National Forest Landscape Management, Vol. 2, Chapter 1, “The Visual Management System.” US Forest Service Handbook No. 462.

______. 1987. Northern Region. Forest Plan, Idaho Panhandle National Forest. August.

3.9 RECREATION

FS regulations and policies related to recreational uses on National Forest lands are contained in the IPNF Forest Plan (FS, 1987) and apply to Segment 3. ITD requirements pertaining to pedestrian and bicycle facilities are relevant. According to the ITD Design Manual (2002), environmental documents should identify existing pedestrian and bicycle facilities; current use; anticipated development of such facilities; potential impacts to the facilities from the proposed project, if any; and measures that would eliminate or reduce adverse impacts.

Affected Environment

Each of the three project segments offers recreational opportunities (Figure 3-14). The primary focus of recreation in Segment 1 is Fernan Lake. Fernan Lake is relatively small and shallow, with 154 ha (381 ac) of surface water, 8.7 km (5.4 mi) of shoreline. Mean depth estimates range between 3 m (10 ft) (Mossier, 1993) and 6 m (20 ft) (DEA, 2003). Public access to the lake is primarily from Fernan Lake Road, which runs along the north shore of the lake. The lake shore is public primarily from the east end of Fernan Lake Village to the East Fernan boat launch, a distance of more than 3.2 km (2 mi). There are about 26 private boat docks associated with homes along the road.

In addition, Fernan Lake Road provides access to the recreational activities of IPNF. Segment 3 is located within IPNF.

Existing Recreational Uses

Opportunities for a wide range of recreational activities exist along or are accessible from Fernan Lake Road, including:

- fishing
- boating
- water skiing and jet skiing
- rowing, canoeing, and kayaking
- bicycling
- pedestrian activities (walking, running, hiking, bird watching, huckleberry picking, snowshoeing, and cross-country skiing)
- all-terrain vehicle (ATV) use
- hunting
- shooting
- snowmobiling
- camping

Fishing

Fishing is the primary recreational activity at Fernan Lake. Fernan Lake is suited to small-boat fishing, a popular recreational activity in the region. The lake provides one of the finest natural urban fisheries in Idaho.


Small boat fishing is a popular recreation use of Fernan Lake.

Unlike many area lakes where a boat is necessary for fishing, fishing from the shore on Fernan Lake's northern shoreline is possible because it is mostly public and contains many accessible fishing spots. The lake's two public docks and easily accessible shoreline make it a popular fishing spot for children.

Fernan Lake is designated as "Family Friendly" fishing lake.

Boating

Motor boating on the lake is typically related to fishing. Some water skiing and pleasure boating also takes place. Many residents of Fernan Lake.

Many resident of Lake Fernan Village own docks on the lake and are frequent pleasure boaters. The average trailer boat at the lake typically does not exceed 4.9 to 5.5 m (16 to 18 ft) (Anthony, 2001). Larger boats are more common at nearby Lake Coeur d'Alene.

Private boat docks mostly occur at the west end of the lake, before MP 0.0

Water Skiing and Jet Skiing

Water skiing and jet skiing at Fernan Lake are activities typically associated with nearby residents who have easy private access to the water.

Hunting

Fernan Lake Road provides access to hunting in the National Forest. Grouse and big game species including elk, whitetail deer, and black bear are hunted in the area. The IPNF authorizes commercial hunting outfitters to do business on National Forest land in summer, fall, and winter. Currently, there are 14 outfitters permitted to operate, and some of these may operate near the project area.

Shooting

Shooting is a year-round activity at the shooting range adjacent to Fernan Lake Road at the beginning of Segment 3. The Fernan Rod and Gun Club operates the range under a special-use permit from the FS. The club currently has approximately 300 members, primarily from northern Idaho and Spokane, Washington. Membership includes local, state, and federal law enforcement personnel, military personnel, and private individuals.

Snowmobiling
Snowmobiling is a popular winter activity in the Coeur d'Alene Mountains. Of four main access routes into the mountains, Fernan Lake Road to Fernan Saddle is one of the most heavily used. Peak use typically occurs from December 10 to March 10.

Camping
Fernan Lake Road provides access to campgrounds located in the IPNF. Camping is not permitted along the road or in adjacent private property in Segments 1 and 2.

Fernan Lake also provides opportunities for local rowing clubs.

Rowing, Canoeing, and Kayaking
Fernan Lake is well suited to small, non-motorized watercraft. Rowing the entire lake and east end marshes is easily done in an afternoon or half-day outing. Fernan Rowing Club utilizes the lake for practice.

Bicycling
Since Fernan Lake Road is fairly narrow and has no riding shoulder, bicyclists must share the roadway with motorized traffic. As a result, families and – children rarely bicycle on the road. Cyclists looking for hilly terrain can climb the road to Fernan Saddle. Mountain bikers can access National Forest trails from Fernan Lake Road.

Bicyclists must share the roadway with motorized traffic.

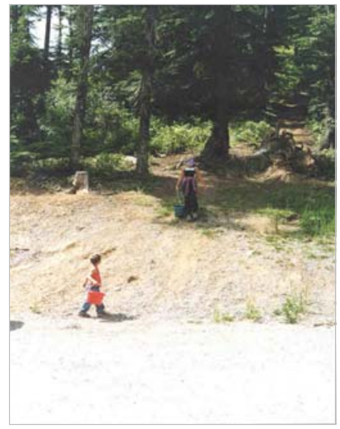
Pedestrian Activities
Fernan Lake Road is used extensively for pedestrian recreation. Many local residents walk or run for pleasure and exercise, especially along the lake in Segment 1. Hiking, birdwatching, snowshoeing, cross-country skiing, and huckleberry picking are all possible from access points in the IPNF.

Fernan Lake Road provides views of lake, wetland, pasture, and forest habitats containing many species of birds. Shirley Sturts, a longtime resident of the Fernan area who is active in the Coeur d'Alene Audubon Chapter has sighted 150 species from Fernan Lake to Fernan Saddle since 1960.

Existing Recreational Facilities

Segment 1

Recreation in Segment 1 is centered around Fernan Lake. Kootenai County Parks and Waterways (KCPW) maintains three lake-related recreational facilities in Segment 1: Fernan Park, Fernan fishing dock, and the East Fernan boat launch. (Figure 3-14).



Huckleberry picking is a popular seasonal activity on IPNF.

Fernan Park

Located in Fernan Lake Village west of the project, Fernan Park is the most developed recreational facility in the project area. Kootenai County owns and maintains the park, which is used more than any other park in the Kootenai County Park System (Robinson, 2001). The park is gated and includes paved vehicle and boat trailer parking, a grassy picnic area, restrooms, and a paved boat launch with docks. Two gangways with handrails provide access to docks on each side of the concrete boat ramp. The western dock extends west, parallel to the shoreline, and is equipped with two benches and four wheelchair-accessible tables to assist disabled anglers. Farther west is a separate dock and moorage racks used by the Fernan Rowing Club for shell storage. In 2000, the boat ramp, concrete abutments, and fishing docks were replaced with new construction, and a new concrete restroom building with vault toilet was installed.

Public access to fishing, boating, and other recreation at Fernan Park would not be affected.

Fernan Fishing Dock

The Fernan fishing dock is located near the east end of Fernan Lake at approximately MP 1.85. A wooden gangway without rails attaches the dock to the shore. Parking at the dock is limited to the road shoulder, with room for perhaps six vehicles. Access to the dock is immediately off Fernan Lake Road and down a short, steep bank. KCPW maintains the dock, and the access ramp area is in the FS easement for Fernan Lake Road. KCPW recently upgraded the dock with a newer (though used) dock. The dock is open to the public and is used extensively throughout the fishing seasons.

Insert Figure 3-14 Recreational

East Fernan Boat Launch

The East Fernan boat launch is located near the east end of Fernan Lake at approximately MP 2.15. The concrete boat launch is located on private property and is maintained by KCPW. The launch structure includes a three- section wooden dock and gangway with handrails to the shore. Near the launch and adjacent to Fernan Lake Road is a large gravel turnout with one or two portable toilets and room for several vehicles. The launch is used heavily in spring and early summer, and is the second most used facility in the Kootenai County Park System. Use of the launch declines in late summer when lilypads fill in around the dock and inhibit fishing and motor boat activities. Use increases again in winter as the launch becomes a primary access for ice fishing on the lake.

Segment 2

Recreational facilities in Segment 2 are limited to use of the roadway for sight-seeing, walking, running and bicycling, and to access to recreation farther uphill.

Segment 3

Segment 3 is entirely within the IPNF and provides access to National Forest Trails. Two trailheads and a shooting range are the only developed recreational facilities accessed directly from Segment 3. The road in Segment 3 has wide places for turnouts and parking. The largest of these, at Fernan Saddle, is used primarily for snowmobile parking.

National Forest

IPNF lands comprise approximately 1 million ha (2.5 million ac) of public land in the Idaho panhandle, eastern Washington, and western Montana. The project area is within the Coeur d'Alene Forest part of IPNF in the Coeur d'Alene River Ranger District. Fernan Lake Road is one of three primary access roads into the Coeur d'Alene Forest. Fernan Lake Road is the primary entrance to the IPNF from the west side.

All-Terrain Vehicle (ATV) Use

ATV use is a popular family activity in the National Forest. Fernan Lake Road provides access to National Forest trails at several locations. One local ATV group (Backcountry ATV), formed in 2000 with 40 members, has seen its membership grow to 170 families in less than one year. Club membership is open to all off-road users but consists primarily of riders of off-road motorcycles, four-wheelers, and bicycles. Backcountry ATV has been working with the FS on an agreement that would expand public access and ATV use within the National Forest.

The large parking area at Fernan Saddle attracts snowmobilers and ATV enthusiasts.

Shooting Range

The Fernan Rod & Gun Club maintains a shooting range on IPNF property at approximately MP 5.1 under a Special Use Permit. The facility is parallel to and below Fernan Lake Road and nearly invisible from the road. Access to the facility is directly off the road. It is open to members only and not the general public.

Fernan Rod & Gun Club operates a shooting range under a special-use permit from IPNF.

Recreational Demand and Need

Recreational demand is largely a function of population, leisure time, and disposable income. All recreational activities in the project area are expecting increased participation in coming years. Recreational facilities are insufficient to meet current demand, and improvement projects are restricted by lack of funds.

The following improvements have been identified by local agencies and the public as needed or desired to meet current and projected recreational demand:

- Designated roadside turnouts and parking areas along Fernan Lake to more safely accommodate shoreline anglers.
- Expanded parking at the Fernan fishing dock and a designated path to the dock gangway.
- Improvements to the East Fernan launch including a lighted parking area and permanent vault toilets (new toilets would require a new location farther from the lake).
- Improvements to shoreline banks between the road and lake to support angler foot traffic and reduce erosion. Suggestions have included the installation of graded benches or riprap to provide structure, and limiting shrubby vegetation that tends to trap trash.
- Improvements to Fernan Saddle, including installation of a water source and restrooms.
- Construction of a parking area at or near the bottom of the Fernan grade.
- Installation of regulatory signs and trash receptacles.
- Widening of road shoulders and/or construction of bicycle lanes.

Environmental Consequences

Direct, Short-Term, Adverse Effects

Alternative E

Direct, short-term, adverse effects under Alternative E would be:

1. Construction activities could temporarily close access or lengthen travel times to recreational opportunities and might reduce or inhibit users during peak construction periods.

2. Shoreline access for fishing would most likely not be available during some construction periods. The significance of this effect would be reduced by keeping portions of the shoreline accessible throughout the construction period.

3. Planned recreational events could be disrupted in part or entirely due to access limitations during construction. Potentially affected events are the summer fishing derby and running and bicycling events. The severity of the impact could be lessened by relocating events or scheduling construction to accommodate events.

4. Construction noise, odor, and dust could compromise the quality of the recreational experience.

Alternative Fm

Direct, short-term, adverse effects under Alternative Fm would be the same as for Alternative E except that if the abandoned alignment between MP 1.0 and MP 2.1 remained accessible to the public during construction, less impact to bank fishing would occur.

Preferred Alternative G

Direct, short-term, adverse effects under Preferred Alternative G would be the same as for Alternative E.

No Action Alternative

None.

Direct, Short-Term, Beneficial Effects

Alternatives E, Fm, and Preferred Alternative G

For all build alternatives impacts could reduce shoreline access during construction, which may result in a temporary reduction of undesirable activities in the area.

No Action Alternative

None.

Direct, Long-Term, Adverse Effects

Alternative E

Direct, long-term adverse effects under Alternative E would be:

1. The addition of guardrails in Segment 1 would eliminate some informally used areas of recreational parking and restrict access to the lake (possibly in two locations). However, turnouts and parking areas in three locations are included in the project design.

2. Alternative E does not include pedestrian or bicycle facilities, and therefore does not meet ITD requirements. However, road reconstruction in Segments 1 and 2 would provide a wider roadway than currently exists (though not as wide as Alternative B) and improve the ability of the road to function as a shared facility for vehicles, bicycles, and pedestrians.

Alternative Fm
Direct, long-term adverse effects under Alternative Fm would be:

1. The addition of guardrails in Segment 1 would eliminate some informally used areas of recreational parking and restrict access to the lake (possibly in four locations). However, turnouts and parking areas in two locations are included in the project design.

2. Alternative Fm does not include pedestrian or bicycle facilities, and therefore does not meet ITD requirements. However, road reconstruction in Segments 1 and 2 would provide a wider roadway than currently exists and improve the ability of the road to function as a shared facility for vehicles, bicycles, and pedestrians.

Preferred Alternative G
Direct, long-term adverse effects under Alternative G would be:

1. The addition of guardrails in Segment 1 would eliminate some informally used areas of recreational parking and restrict access to the lake (possibly in five locations). However, turnouts and parking areas in three locations are included in the project design.

2. Preferred Alternative G does not include pedestrian or bicycle facilities, and therefore does not meet ITD requirements. However, road reconstruction in Segments 1 and 2 would provide a wider roadway than currently exists (though not as wide as Alternative B) and improve the ability of the road to function as a shared facility for vehicles, bicycles, and pedestrians.

No Action Alternative
The No Action Alternative would leave the road in its existing condition. As recreational use is expected to increase, resulting in more vehicles, pedestrians, and bicyclists using the road for parking and access to recreational points, existing hazardous conditions and accident rates would worsen.

Direct, Long-Term, Beneficial Effects

Alternative E
Direct, long-term beneficial effects under Alternative E would be:

1. Road improvements would include safer corners and improved sight distances, providing a safer route to recreational activities and facilities.

2. Turnouts and parking areas would be created in Segment 1 (possibly in three locations: MP 1.5, MP 1.8, and MP 2.2) where the road is realigned to the north (away from the lake).

3. The area between the road and shoreline, both sides of the proposed bridge, at the East Fernan boat launch would be enlarged and could be improved for recreation.

4. The area between the road and shoreline at the Fernan fishing dock would be enlarged and could be improved for recreation.

Alternative Fm
Direct, long-term beneficial effects under Alternative Fm would be:

1. Road improvements would include safer corners and improved sight distances, providing a safer route to recreational activities and facilities.

2. Turnouts and parking areas would be created in Segment 1 (possibly in two locations: MP 2.0, MP and MP 2.2) where the road is realigned to the north (away from the lake).

3. A portion of the abandoned road alignment (MP 2.0) could be utilized as a trail, shoreline access and recreation parking.

4. The area between the road and shoreline at the Fernan fishing dock would be enlarged and could be improved for recreation.

Preferred Alternative G
Direct, long-term beneficial effects under Alternative G would be:

1. Road improvements would include safer corners and improved sight distances, providing a safer route to recreational activities and facilities.

2. Turnouts and parking areas would be created in Segment 1 (possibly in three locations: MP 1.5, MP 1.8, and MP 2.2) where the road is realigned to the north (away from the lake).

3. The area between the road and shoreline at the East Fernan boat launch would be enlarged and could be improved for recreation.

4. The area between the road and shoreline at the Fernan fishing dock would be enlarged and could be improved for recreation.

No Action Alternative
None.

Indirect effects: Alternatives E, Fm, and Preferred Alternative G
Indirect effects under the build alternatives would be:

1. Improvements to Fernan Lake Road under any of the build alternatives might encourage more recreational use of the area.

2. Improving road safety would enhance the overall recreational experience for visitors and save lives.

Cumulative Effects: Alternatives E, Fm, and Preferred Alternative G

Cumulative effects were assessed by looking at effects of the proposed project combined with effects from other planned projects within the project area.

1. The planned installation of restrooms at Fernan Saddle and a warming hut at Skitwish Mountain would expand recreational opportunities in the National Forest, encourage visitors to return to the area more frequently, and possibly stay longer.

2. The planned multi-use clubhouse near the shooting range would accommodate meetings, classes, and other events year-round, thereby contributing to the projected increase of traffic on the road.

3. Residential construction in the area is expected to continue, resulting in a larger local population that can be expected to use nearby recreational areas on a regular basis.

4. Recreational visits to the project area are expected to increase as the population of the region grows, and visitor numbers are likely to exceed the current carrying capacity of environmental and recreational resources. Improvements to the road under any of the build alternatives would help in managing the increased recreational activity and in minimizing adverse impacts to the lake and National Forest.

Recommended Mitigation Measures

Alternative E

Recommended mitigation measures for Alternative E are:

1. Designate roadside pullouts and off-road parking to improve safety and opportunity for shoreline access along Fernan Lake.

2. Expand the parking area at the Fernan fishing dock and construct a path to the dock gangway.

3. Use the expanded shoreline turnout area at East Fernan launch for organized parking. Install a security light and permanent vault toilets.

4. Where possible, install graded benches or riprap between Fernan Lake Road and Fernan Lake to support bank fishing and angler foot traffic, and to reduce erosion.

5. Provide a parking area for winter recreational users at or near the bottom of the Fernan grade.

6. Include regulatory signage to discourage undesirable activities and allow law enforcement to better regulate activities in the area. Suggested signage: No overnight camping, no campfires, no littering, parking in designated areas only, share the road with bicyclists.

7. Include a widened shoulder or bicycle lane.

Alternative Fm

Recommended mitigation measures for Alternative Fm include the measures listed for Alternative E with the additional measure of negotiating public access to some or all of the road easement between MP 1.0 and MP 2.1 as a recreational access, provided that either the FS or Kootenai County accepts maintenance responsibility.

Preferred Alternative G

Recommended mitigation measures for Alternative G include the measures listed for Alternative E.

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3.10 SOCIO-ECONOMICS

U.S. Census Bureau census data were used to identify the characteristics of the population in the area surrounding Fernan Lake Road and to determine historic population growth trends. Population data from the 1960, 1970, 1980, 1990, and 2000 censuses were compared for the State of Idaho, Kootenai County, and the cities of Coeur d'Alene and Fernan Lake Village. Since Census Tract boundaries are changed between surveys, it is not possible to make direct comparisons for the area surrounding the project over time. Detailed census information about population and household characteristics was used to identify minority and low-income areas.

Information on employment and economy was obtained from the Idaho Department of Commerce. Per capita income data are from the Bureau of Economic Analysis.

Affected Environment

Population

The 2000 census counted a population of 1,293,953 in Idaho. Since 1960, growth has occurred in spurts, rather than a steady increase. State population growth rate is projected to be between 1.4 percent and 1.7 percent over the next two decades, compared to an average rate of 2.7 percent in the 1970s and 1990s. Such growth would bring the state population to 1.72 million by 2020. The state ranks sixth in the nation for the amount of projected population increase to 2025 (Church, 2001). According to the Kootenai County Area Transportation Plan (Kootenai County, 1998), the population for Kootenai County is projected to grow to approximately 156,000 by 2017 or by 2.5 percent per year. Growth forecasts are not available for smaller subareas or communities around the Fernan Lake Road project area, so the countywide growth rate was used to project the impact of growth on traffic on Fernan Lake Road.

Employment

Total non-farm employment in Idaho grew by over 200,000 between 1980 and 1998, from approximately 330,000 to 560,000 (Idaho Department of Commerce, no date). Most of the increase occurred in the 1990s, with an average growth rate of nearly 3.8 percent per year. Likewise, total employment in Kootenai County more than doubled between 1980 and 1999, from 23,557 to 55,639. Growth in employment was generally slow in the first half of the 1980s, growing by 2,260 employed. Over the following five years, employment grew by more than 6,000 to a total of 26,493. The biggest jump was from 1990 to 1999 when employment grew by nearly 30,000, a 110 percent increase. Total non-farm employment is expected to increase at an annual average rate of 2.1 percent through 2020. Farm employment has been declining during the past 25 years and is expected to continue to decline modestly because of productivity gains.

The growth in non-farm employment opportunities between 1980 and 1998 affected the unemployment rate. In 1980, the unemployment rate was 11.7 percent, which declined to 8 percent by 1990 and rose slightly to 8.5 percent by 1997.

Type and number of jobs in Idaho changed notably over the last two decades. The state's traditional resource-based manufacturing industries–food processing, lumber and wood products, and primary metals–are not as important to the economy as in the past. In 1970, those three sectors made up 73 percent of manufacturing jobs. By 2000, the same sectors accounted for 39 percent of manufacturing jobs. These trends are expected to continue (Idaho Department of Commerce, no date). Food processing employment is expected to decline by 400 jobs (-0.1 percent annual rate) by 2020. The lumber and wood products and metals sectors are expected to remain flat or decline. However, manufacturing employment as a whole is expected to continue to increase at an annual average rate of 1.3 percent to 2020, mostly in the non-electrical machinery and electrical/electronic equipment industries.

The secondary industries (wholesale and retail trade, finance, insurance and real estate, contract construction, and services) are expected to provide the majority of the state's future employment growth (Idaho Department of Commerce, no date). Wholesale and retail trade employment is projected to grow from 140,400 in 2000 to nearly 222,7000 in 2020. Employment in the construction industry grew by 7.4 percent a year in the 1990s and is projected to grow annually by 2.1 percent to 2020.

The industry with the greatest number of employees in Kootenai County is the services industry, which employed more than 16,000 people in 1999. Retail trade employment is the next largest sector, with 12,325. In the past decade, employment in all industries except mining and federal military employment grew in Kootenai County. The construction sector saw the greatest growth since 1990, up 110 percent by 1999. The other large sectors–services, retail trade, state and local government, and manufacturing–showed less but still dramatic growth, ranging from 39 to 80 percent. Those five industries accounted for over 80 percent of total employment in 1999.

By 2020, total non-agricultural employment in the county is expected to increase to more than 70,000 (over 60 percent from 1990). More than one-quarter of the increase is projected to be in the wholesale and retail trade sector, whereas manufacturing is projected to account for less than 2 percent of the growth (490 jobs).

Income

Per capita income in the county increased from $15,070 in 1989 to $22,527 in 1999, an average annual growth rate of 4.1 percent. In 1989, the per capita income in the county ranked 11th in the state. The 1999 county per capita income was $344 below the state (ranked 8th) and $6,019 below the national per capita income (Bureau of Economic Analysis, no date). Median income is the income level at which half the population earns a lower income and half earns a higher income. In 2000, median income in Kootenai County was slightly higher than for the state. Figures for Coeur d'Alene were approximately $4,000 lower than for the state and county. Median income in Census Tract 16 was below city, county, and state levels. In contrast, both Census Tract 17 and Fernan Lake Village had median incomes exceeding those of the other groups. The project area is not a low-income area as defined by FHWA guidance.

Environmental Justice – EO 12898

Minorities

FHWA's guidance (FHWA Order 6640.23) defines minorities as individuals who are members of the following population groups: American Indian or Alaskan Native, Asian or Pacific Islander, Black, or Hispanic. US Census (2000) information was used to determine the number of people in each of the racial groups (Black or African American, American Indian & Alaskan Native, Asian, Native Hawaiian & Other Pacific Islander, some other race, and two or more races). These data were combined to calculate the overall percentage of the population that is minority.

The minority population is not above 50 percent in any of the geographic areas included in the analysis. In every minority category except Asian, the Census Tract directly impacted by the project has a lower proportion of minorities than Coeur d'Alene, Kootenai County, or the state. Therefore, the area is not a minority community as defined by FHWA guidance.

Poverty

Census Tract 17 (where direct impacts from the project would occur) had a lower proportion of people living in poverty than Census Tract 16, Coeur d'Alene, Kootenai County, or the state. Census Tract 16 (west of the project area) has three times as many people living in poverty as Census Tract 17 (415 versus 154 individuals). However, the level of poverty in Census Tract 16 is not significantly different than that of the city or county.

Public Outreach

An important component of EO 12898 is ensuring that all portions of the population have a meaningful opportunity to participate in the development of federal projects regardless of race, color, national origin, or income. Guidance from the Council of Environmental Quality (CEQ) states that agencies should acknowledge and seek to overcome linguistic, institutional, geographic, and other barriers to meaningful participation, and should incorporate active outreach to affected groups.

Meetings with the Fernan Lake Conservation and Recreation Association (formerly the Fernan Lake and Valley Homeowners Association) were held on April 6, 2000, and May 17, 2000. This group represents property owners in the area.

Late in 2000, FHWA determined that an EIS should be prepared. FHWA NEPA regulations require that a public scoping meeting be held. Two such meetings were held in 2000. An additional public scoping meeting was held on Wednesday, June 20, 2001, at 4 PM at the Coeur d'Alene Inn. FHWA and consultant staff explained the change in process from an Environmental Assessment to an Environmental Impact Statement. They presented project objectives; schedule for completing NEPA requirements; proposed alternatives; traffic, environmental, and safety concerns; and issues and concerns identified in earlier phases of the project. Participants were asked to provide oral or written comments. Small groups discussed the alternatives in terms of the project objective.

To keep the public informed, FHWA created a newsletter for the Fernan Lake Road project. Three issues of the newsletter have been distributed to the mailing list. Newsletters are available from the Western Federal Lands Highway Division (WFLHD), the ESHD, and the IPNF Fernan Lake Ranger District.

Relocation and Property Acquisition

Although federal-aid highway projects are designed to benefit the community at large, they may disproportionately impact those whose real property must be acquired or whose homes and businesses must be displaced for the improvements. The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act), as amended, establishes land acquisition policies for federal and federally funded programs and activities. The purpose of the Uniform Act is to minimize the hardship of displacement and ensure that displaced persons are assisted when activities designed for the benefit of the public take place. The Uniform Act is designed to ensure that people whose real property is acquired, or who move as a result of any project, receive federal compensation for their property, are treated fairly and equitably and receive assistance in moving from the property they occupy. The Uniform Act requires agencies, in acquiring property for a project, to negotiate with property owners in a prompt and amicable manner so that litigation may be avoided. Negotiations are based on the agency's estimate of just compensation, which is based on an appraisal of fair market value. People and businesses required to move as a result of a project are provided advisory services, payments to help carry out the move, and payments to defray necessary added housing costs.

Although no residents are anticipated to be displaced by this project, if there are displacements, no one would be required to move until adequate housing within his or her financial means was made available.

Environmental Consequences

Population

None of the alternatives would have any direct impact on population. No residents would be displaced under either of the build alternatives.

Employment

Construction under any of the build alternatives likely would require hiring 50 to 100 workers, depending on the duration of construction. The principal contractors likely would be from Spokane, with workers hired from the Coeur d'Alene–Spokane region. Long-term maintenance would continue to be provided by ESHD under agreement with the FS and would not require new hires. The roadway would likely require less maintenance under the build alternatives than its current condition.

None of the build alternatives would have a direct impact on long-term (permanent) employment. However, expenditures related to project construction (estimated to be $9 to $14 million) may increase employment in the area in the short term.

There would be no short-term increase in employment under the No Action Alternative, as no construction jobs would be generated. There would be no long-term, direct employment impacts under the No Action Alternative, either.

Communities, Residents, and Businesses

None of the build alternatives would fragment existing residential neighborhoods because the improvements would be made within 200m (300 feet) of the existing road. Five parcels are split by alternative Fm, while Alternative E and Preferred Alternative G affect only the front or rear of existing parcels.

The houses in Fernan Lake Village and along Fernan Lake Road, Fernan Terrace, and Fernan Hill Road would be impacted by construction traffic, noise, dust, and potential access problems during construction. In the long term, realigning and widening the roadway would typically result in homes along the road being closer to the road. While under both alternatives, the same number of houses would be closer to the new centerline, there would be more impacts under Alternatives Fm (the roadway would be closer to the houses) than under Alternative E and Preferred Alternative G.

For parcels that front along Fernan Terrace Road, only the rear portions of the properties would be impacted by all build alternatives. Under Alternative Fm, the residences on parcels would be nearly the same distance from the centerline as they are now. The residence on one parcel would be farther from the centerline, and one parcel would be considerably closer to the new centerline under Alternative Fm.

The residence on one parcel is considerably closer to the road under Alternative Fm than any other Alternative. Alternative Fm is elevated nearly 10m (30 feet) where it bisects this parcel, resulting in view and access impacts.

Otherwise, the impacts to these parcels under all alternatives are considered minor because the residences are set back more than 30 m (98 ft) from the existing roadway, the easement areas to be acquired are on steep portions of the lots, and most of the homes are considerably upslope from the road. The noise and dust during construction would occur downslope from a majority of residences.

The land in the easements would not be easily built upon now because of the steep slope. The wider roadway easement would not impact long-term access to any of the developed properties. In the short term, benefits to the Coeur d'Alene community would include purchases made by construction workers for food, gasoline, and other goods. As noted in project construction would add construction jobs, as well as indirect and induced employment. Some of the jobs likely would be filled by people in the local community. The direct, indirect, and induced expenditures related to project construction would also benefit the local economy in the short term.

The Fernan Road and Gun Club would not be directly affected, other than during construction. Although the existing roadway would be improved, access to and from the club would not change. Other recreational use of the roadway and Fernan Lake would be affected by construction-related delays, noise, dust, and temporary road closures. Recreation impacts are more fully discussed in the Recreation Technical Report.

Environmental Justice

FHWA defines a disproportionately high and adverse effect on minority and low-income populations as one that:

- is predominantly borne by a minority population and/or a low-income population; or
- will be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority population and/or non-low-income population.

None of the build alternatives would have a disproportionately adverse effect on minority or low-income populations. Also none of the build alternatives would result in residential or business displacements. All ROW would be in easements, allowing continued use of properties, except for one parcel. This vacant parcel is located immediately north of the road at approximately MP 2.1. The easement for the new road would cover the majority of the property limiting its development potential.

Relocation and Property Acquisition

The proposed project would not displace any residents or businesses. While ROW easements would be obtained on many parcels, the easements would affect only portions of residential properties and would not interfere with residents' continued use of the remainder of their property. At this stage of the project planning process, easement areas are approximate. Actual easement areas and costs will be determined once an alternative is selected and the design is refined. All property owners from whom easements would be obtained for the selected project alternative would be compensated according the Uniform Act and paid fair value for the affected property.

No displacements to residents or businesses would occur if the No Action Alternative were implemented. No additional easements would be required.

Indirect and Secondary Impacts

Indirect impacts are caused by the project but occur later in time or are farther removed in distance, yet are still reasonably foreseeable. No indirect or secondary impacts to population, employment, communities, residents, or businesses, or environmental justice populations are expected from construction of proposed road improvements.

Although the proposed improvements would ensure the long-term accessibility of the lake and forest areas to urban Coeur d'Alene, the project would not change access. Traffic would increase along Fernan Lake Road under the No Action Alternative as well as the build alternatives.

All build alternatives would improve safety and access to Fernan Lake and FS lands to the north. It is not expected to have a significant effect–either an increase or a decrease–on the level or pattern of development that would use the road as a primary access route. The area is zoned for rural uses and would likely continue to remain in the same uses.

The indirect impacts for the build alternatives are similar, with the exception that under Alternative Fm, new Tax Lots would be created where the proposed alignment would cross five large existing Tax Lots and create the potential for new access. This could result in the owners' subdividing and developing them sooner than would otherwise happen. Nevertheless, the potential impacts from development of these additional parcels would be negligible in terms of the overall land use pattern or traffic on the road.

Recommended Mitigation Measures

Two mitigation measures are recommended:

- Owners of properties affected by ROW easement acquisition would receive monetary compensation in accordance with the Uniform Act.
- FHWA would require the construction contractor to mitigate construction effects such as temporary disruptions to travel patterns, and increased noise, dust, and congestion through the use of a variety of mitigation measures. Standard mitigation includes notifying adjacent properties of upcoming activities, signing, and scheduling temporary road closures for low-traffic times. Measures also include providing erosion control, noise abatement, and dust abatement.

The proposed project would result in no disproportionate significant adverse impacts to minority or low-income persons; therefore, no mitigation measures related to EO 12898–Environmental Justice would be necessary.

Cumulative Impacts

Cumulative impacts are assessed by looking at the impacts of both the proposed project and other projects or actions within a defined area. Cumulative impacts occur in those situations where an individual project or action alone may not have a significant effect, but when combined with the effects of other projects or actions, the result is an overall adverse cumulative effect.

The only related projects associated with improving Fernan Lake Road are plans by the FS to close a number of smaller unimproved roads within the Idaho Panhandle National Forest. These roads are nearby but are not connected to Fernan Lake Road and would not constitute a cumulative impact.

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3.11 OTHER ISSUES

Air Quality

The Clean Air Act requires the Environmental Protection Agency (EPA) to identify and set standards for pollutants that have an adverse effect on human health. The EPA has issued National Ambient Air Quality Standards (NAAQS) for six pollutants of concern. Areas that exceed these standards are called non-attainment areas and are required by the EPA to implement special measures to bring them back into compliance. Kootenai County, Idaho, which includes the City of Coeur d'Alene and its surrounding areas, is a federally designated attainment area for all criteria pollutants of concern. This means that it complies with the NAAQS and does not require special programs to maintain this compliance. The Idaho Administrative Code (IAC) incorporates the NAAQS directly.

The Idaho Department of Environmental Quality (IDEQ) governs air quality in Idaho. IDEQ administrative rules require a conformity analysis for transportation projects located in non-attainment or maintenance areas. In addition, IDEQ has identified several air quality areas of concern, where greater consideration of CO and PM_{10} impacts should be incorporated in an air quality analysis. The Coeur d'Alene/Post Falls Urban Area is designated as one such area of concern for PM_{10}; however, Fernan Lake Road falls outside of this urban area and so is not included in this area of concern. The road improvement project is also unlikely to be classified as regionally significant (Personal Communication - IDEQ, 2001). An air quality conformity analysis is not required for the Fernan Lake Road Project because it is in an area that complies with the NAAQS.

Air pollutants of concern for highway projects are carbon monoxide (CO), nitrogen oxides (NO_x), and volatile organic compounds (VOC). Particulate matter (PM_{10}) can be of concern in dry or dusty areas where PM_{10} concentrations are approaching the NAAQS. VOCs and NO_x react with sunlight to produce ozone. Ozone is generally a pollutant of concern associated with urban areas. Ozone problems tend to be regional in nature because the chemical reactions that produce ozone occur over a period of time. Ozone is not a pollutant of concern for the Fernan Lake Road Project because the project is located in a non-urban area that has no history of ozone problems.

Affected Environment

Fernan Lake Road begins at the southeast corner of the City of Coeur d'Alene, Idaho, in Fernan Village and continues east. The City of Coeur d'Alene is the largest city in northern Idaho, with a population of 32,200 in 1999 (Idaho Department of Labor). Its climate is variable, with mean temperatures ranging from the high 20s (F) in the winter to the high 60s (F) in the summer, and an annual mean rainfall of about 25 inches (Western Regional Climate Center).

IDEQ currently has two ambient air quality monitoring stations in Coeur d'Alene, both measuring airborne particles (PM_{10}). There have been no recorded exceeds of the PM_{10} standard in Coeur d'Alene since 1990.

ADT volumes were used to compare CO emissions from vehicles associated with the Fernan Lake Road project alternatives. CO emissions are directly related to traffic volumes. The existing (2001) ADT for Fernan Lake Road is 810 vehicles on Segment 1 and 430 on Segment 2. The future Build and future No Action traffic volumes are identical because the project does not seek to increase traffic volume capacity on Fernan Lake Road. The projected future (2026) ADT for Fernan Lake Road is 1,500 vehicles on Segment 1 and 795 on Segment 2.

EPA's Mobile_5b Vehicle Emissions Model was used to calculate vehicle emission factor estimates for CO in grams per mile. The model outputs are shown in Table 3-13. Mobile_5b emission factor model input assumptions were prepared in accordance with the IDEQ *Project Level Air Quality Screening, Analysis, and Documentation for Roadway Projects in Idaho.*

Table 3-13. Mobile_5b CO Emission Factors (35 mph)

Alternative (year)	CO Emission Factor (grams/mile)
2001	20.863
2026	17.615

Table 3-14 shows a decrease in the amount of CO emitted per vehicle on Fernan Lake Road between 2001 and the design year (2026). This is due to vehicle emission reduction technology resulting in cleaner vehicles, as well as the effect of having fewer older, more polluting vehicles still on the road by 2026.

The average CO emissions from vehicles using Fernan Lake Road were calculated using these data. The results are shown in Table 3-14.

Table 3-14. Annual Fernan Lake Road Vehicle-Related CO Emissions

Alternative (year)	CO Emissions (tons/year)
Existing (2001)	25
No Action (2026)	38
Build Alternatives (2026)	38

Table 3-14 shows an increase in the overall amount of CO emitted from highway-related sources on Fernan Lake Road between 2001 and the design year (2026). This is due to the increased traffic volume that is predicted to use the roadway between now and 2026. However, this still represents a relatively low volume of vehicles per day in an area with no existing air quality problems. It is unlikely that this increase will lead to any air quality problems in the area. In addition, no existing or proposed alignment for the road includes any intersections where congestion could occur. Intersections are the most likely location for potential CO impacts.

Since the future Build and No Action traffic predictions are the same, an increase in CO emissions would result from the projected growth in traffic each year, with or without the project. This increase would be offset by any improvements in vehicle emissions technology. Consequently, the improvements to Fernan Lake Road proposed under the build alternatives will not lead to any direct increase in vehicle-emitted pollution.

Environmental Consequences

Direct Impacts

The project does not include or directly affect any signalized intersections that are predicted to operate at LOS "C" or worse. The project does not include or directly affect any roadways for which the 20-year forecast daily volume will exceed 15,000 vehicles. It can therefore be concluded that the project will have no significant adverse impact on air quality.

For informational purposes, a comparison of CO emissions based on ADT has been provided. The future Build and No Action peak season ADT is predicted to be 1,500 vehicles on Segment 1 and 795 vehicles on Segment 2, as compared with an existing ADT of 810 vehicles on Segment 1 and 430 vehicles on Segment 2.

The ADT comparisons show that an increase in CO emissions will occur through natural annual traffic growth regardless of the Fernan Lake Road improvement project. However, the CO emissions in the design year of 2026 are still unlikely to cause any air quality problems in the area.

Short-term air quality impacts could occur due to emissions of dust as a result of construction during the project. The Idaho Administrative Code (IDAPA 58.01.01.650) requires all reasonable precautions be taken to prevent the generation of fugitive dust during the construction phase. Reasonable control measures in the regulations include the use of water or chemicals to reduce dust generation, the application of dust suppressants, the use of control equipment, the covering of trucks transporting material, and the prompt removal of earth or other material from streets. Contractors would be required to comply with these regulations, and therefore no air quality impacts are expected as a result of construction activity.

Potential air quality impacts resulting from the burning of vegetative debris removed during the construction phase was not estimated. Potential impacts would depend heavily on wind speed and direction at the time of combustion.

Indirect Impacts

There are no predicted indirect air quality impacts associated with this project.

Cumulative Impacts

The traffic data supplied for this project include cumulative traffic impacts; as a result, the air quality analysis includes cumulative impacts from general growth in the project area.

Air quality impacts from road sources are not expected to occur as a result of the Fernan Lake Road Project; therefore, mitigation for air quality impacts is not required.

In order to mitigate the potential effects of combustion of vegetative debris removed during the construction phase, disposal options other than open burning should be employed.

Mitigation

1. The contractor would be required to coordinate with utilities to minimize service disruptions.

2. All construction equipment will be required to be in good working condition. Regular inspection will ensure this.

3. Equipment would not be idled during periods of inactivity.

4. More energy-efficient equipment should be used where there is a choice between alternative equipment.

Noise

The Federal Highway Administration (FHWA) regulates noise resulting from vehicular traffic (23 CFR 772). The FHWA noise abatement criteria are shown in Table 3-15. There are no state or local noise regulations that govern noise from construction or blasting activities that may also be associated with the project.

Table 3-15. FHWA Traffic Noise Abatement Criteria

Description of Activity	Abatement Criteria (L_{eq} - dBA)
Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.	57 (exterior)
Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.	67 (exterior)
Developed lands, properties, or activities not included in the previous two categories.	72 (exterior)
Undeveloped lands.	--
Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and rooms, auditoriums.	52 (interior)

23 CFR Part 772 (*Procedures for Abatement of Highway Traffic Noise and Construction Noise*) defines the FHWA Noise Standards and noise abatement criteria (NAC). The federal regulations state that a noise impact occurs when the predicted traffic noise levels approach or exceed the NAC or substantially exceed existing noise levels. The regulations do not define "approach" nor "substantially exceed." In June 1995, FHWA issued a Policy and Guidance (P & G) memorandum and document. The 1995 P & G required that State Highway Administrations (SHAs) adopt written noise policies to be approved by FHWA by June 1, 1996. The P & G required the definition of "approach" used by the SHAs to be at least 1 dBA less than the NAC. The P & G does not provide requirements for the definition of "substantially exceed." However, information is provided indicating that 10 or 15 dBA is commonly used for this criterion. Because the Fernan Lake Road Safety Improvement Project is under the direct jurisdiction of the FHWA, the federal regulations and guidance would apply.

Noise is generally defined as unwanted sound and is measured in terms of sound pressure level. Most people perceive a 10-dBA change in noise level as a doubling in loudness (e.g., an increase from 50 dBA to 60 dBA causes the loudness to double). The minimum change in sound levels that can be perceived by a person with normal hearing is generally 3 dBA.

Noise levels decrease with distance from a noise source. This difference results from the spherical propagation of sound from a point source as compared to the cylindrical propagation of sound from line sources. Additional noise reduction (attenuation) can be provided by wide tracts of dense vegetation, terrain effects, and atmospheric effects that block or absorb noise.

Traffic noise levels for this project were calculated using the FHWA's Traffic Noise Model (FHWA TNM® Version 1.1). The model was run using peak traffic hour data for each alternative to predict the peak traffic noise impacts. Model calibration and existing conditions modeling were conducted using 85th percentile speeds measured on the existing alignment during the traffic survey. Future Build and No Action modeling were conducted using the posted speeds on Segments 1 and 2.

Existing noise levels were monitored at 10 locations representative of 26 receptors (Figure 3-15). Measured noise levels and a comparison of modeled and measured noise levels for calibration locations are shown in Table 3-16. If measured and modeled results are within 2 dBA, the model is considered to reasonably predict actual noise levels.

Insert Figure 3-15 Noise

Table 3-16. Comparison of Modeled and Measured Noise Levels (L_{eq})

Monitoring Point No.	Modeled Noise Level (dBA)	Measured Noise Level (dBA)
1	N/A	45
2	N/A	45
3	49	47
4	51	50
5	49	47
6	N/A	50
7	49	51
8	44	44
9	46	48
10	46	48

Measurements made June 21st – 23rd, 2001. TW Environmental Inc.

There are no known noise studies that were performed in the project area.

Environmental Consequences

Direct Impacts

Predicted traffic noise levels for the peak noise hour are shown in Table 3-17 for existing conditions, future no action conditions, and future build Alternatives E, Fm, and Preferred Alternative G.

Table 3-17. Calculated Sound Levels (L_{eq} - dBA) for Selected Receptors under Build Alternatives E, Fm, and G

Receptor	Alternative E	Alternative F	Alternative G
R11	47	47	47
R14	50	50	50
R17	58	59	59
R18	55	50	54
R23	52	52	52

Noise levels for Alternatives E, Fm, and G were calculated for all receptors where the alignment of one of these alternatives moves closer to the receptor than the alignment of either Alternative B or D.

The results of the modeling and analysis for all build alternatives show that none of the properties adjacent to Fernan Lake Road are predicted to experience noise levels exceeding the 66-dBA residential impact criterion, or to experience noise levels that increase by 10 dBA over the existing levels. Therefore, no noise impacts are expected at properties adjacent to Fernan Lake Road for any of the alternative alignments. This is predominantly because of the relatively low existing and predicted traffic volumes.

Noise from construction activities is not regulated in the project area. However, construction of the project may cause localized, short-duration noise impacts.

Using the EPA data on construction equipment noise, the upper noise limit of rock drills of 98 dBA at 50 feet was used to calculate the potential worst-case noise levels resulting from construction. The results show the properties adjacent to the roadway could potentially experience short-term noise levels of between 82 and 108 dBA. Considering the existing normal ambient noise levels of between 45 and 50 dBA, if the noise levels from construction reach these levels, annoyance at these properties is likely, particularly if work is not confined to normal daytime hours (7 a.m. to 10 p.m.).

Short-term controlled blasting required to clear ground for the future alignment, to modify slope gradients, and for rock sculpturing may also result in short-term noise impacts.

Noise impacts from blasting will vary according to such factors as the placement of the explosive charges and the size of each charge. Charge placement and size will, in turn, be influenced by factors such as the cross-section of material to be cleared, the proximity to structures that could be affected by high particle velocities, and the possibility of fly-rock being deposited in the lake. To quantify the range of possible noise impacts at residences in the project area, a selection of US Forest Service rural blasting noise field measurements conducted in 1994, and compiled in a USDA Forest Service report **(**1996**),** were used to calculate possible noise ranges at the nearest residences to blasting locations along the alignment.

Neither the State of Idaho nor Kootenai County has noise policies governing noise from controlled blasting.

Blasting has the potential to disturb wildlife in the area. For more information on potential wildlife disturbances associated with the project, please see the Biological Technical Report of the EIS.

Indirect Impacts

Potential indirect noise increases could occur as a result of increased recreational uses if improvement to the road allows increased recreational use. Noise sources would be expected to be similar to existing sources (boats, jet skis, and other human activities). Overall noise levels are still expected to be low and significant noise impacts would not be expected.

Cumulative Impacts

The data supplied for this project include cumulative traffic impacts; therefore, the noise impact analysis includes cumulative impacts.

Recommended Mitigation Measures

Long term noise levels are not predicted to exceed impact criteria at any of the properties adjacent to Fernan Lake Road for any of the alternatives analyzed; consequently, no noise impacts are predicted and no mitigation is required for projected traffic volumes.

The major noise impact of any of the build alternatives would be as a result of road construction and controlled blasting. The following techniques can be used to minimize the negative effects of construction equipment noise:

- Stationary noise sources should be placed as far from sensitive receivers as possible. Portable noise barriers (such as vehicles and equipment) or natural terrain features, can be used between the noise source and sensitive receivers to provide shielding.

- Idling equipment should be turned off. Equipment operators should drive forward instead of backward whenever possible, lift instead of drag materials, and avoid scraping or banging activities that can be accomplished by quieter hand methods.

- Work that does not need to be done at night should be confined to daytime hours. Daytime hours are normally defined as 7 a.m. until 10 p.m.

- Construction noise can be further reduced through the use of properly sized and maintained mufflers, engine intake silencers, ambient sensitive backup alarms, engine enclosures, noise blankets, and rubber linings.

Mitigation will be required to keep blast noise impacts below reasonable levels. It is likely that mitigation will be effective in keeping blast noise below levels discussed above at a large number of the properties in the area. However, for a small number of residences that are near to blast areas, particular care will be necessary in mitigating the blast noise. Mitigation measures employed by blasting contractors to reduce the noise impacts of blasts may include, but are not limited to:

- Require a comprehensive blast design plan, including blast monitoring and blast documentation, to be developed by the blasting contractor, with pre-blasting acceptance of the plan required.

- Require a pre-blast survey of local residents to be performed by the blasting consultant or blasting contractor. Monitor for both noise and vibration during blasting.

- Calculate the charge size to maintain the lowest possible powder factor to accomplish the blasting goals.

- Cover detonation cord on the surface, when used, with a minimum of 6 inches of fill.

- Fire all shots in pre-drilled or dug holes that are properly stemmed or back-filled.

- Place sandbags or other fill over loaded holes.

- Use blasting caps rather than cap and fuse techniques.

- Do not fire two holes side-by-side simultaneously. Millisecond delays should be used between holes.

- Limit the powder factor to one-quarter pound of explosives per cubic yard when air-gapping boulders.

Hazardous Materials

An Initial/Phase I Site Assessment (ISA) for the Fernan Lake Road project in Coeur d'Alene, Idaho was conducted to identify areas that may have potential "hazmat-type" environmental conditions or concerns associated with hazardous materials and, if appropriate, provide recommendations for mitigation or additional assessment. The ISA was conducted in general accordance with ASTM Practice E 1527 (Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process). Exceptions or deletions from ASTM E 1527 are listed in the Limitations section of this report.

The following database listings were compiled and reviewed for the listed search distances from the site:

- U.S. Environmental Protection Agency (EPA) National Priorities List (NPL) for facilities with the highest priority for cleanup pursuant to the EPA Hazard Ranking System (1.8-km [1-mile]radius).

- EPA Region 10 Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS), which contains information on facilities where releases of hazardous substances are either suspected or confirmed (1.8-km [1-mile] radius).

- EPA Emergency Response Notification System (ERNS) list of reported hazardous substance releases or spills (0.45-km [1/4-mile] radius).

- EPA Resource Conservation and Recovery Information System (RCRIS) list of permitted hazardous waste treatment, storage, and disposal facilities (1.8-km [1-mile] radius) and permitted hazardous waste generators (site and contiguous properties).

- EPA list of Resource Conservation and Recovery Act (RCRA) permitted hazardous waste generators (site and contiguous properties).

- Idaho Department of Environmental Quality (DEQ) registered underground storage tanks (UST) list (site and contiguous properties).

- DEQ leaking UST database list containing an inventory of reported leaking UST incidents (0.9-km [0.5-mile] radius).

- DEQ List of Active and Closed Municipal and Non-Municipal Landfill Sites (1.8-km [1-mile] radius).

Affected Environment

Records Review Findings. One facility/case file known as Chris Watt Trucking, 406 Fernan Road, was found on the reviewed listings for the search distances. This file was noted on the RCRIS listing and identifies a small-quantity generator of hazardous waste at this address; no regulatory violations are noted in the file. The 406 address corresponds to a vacant property at the east end of Fernan Village. No structures, operating business, operating facility, or other potentially adverse conditions were observed on the property. The potential for environmental conditions at this address to affect the project is low.

Historical Information. Historic public information indicates Fernan Lake Road was constructed in the 1930s. Metzger maps for the years 1950 to 1990 for the Fernan Lake area were reviewed at the Coeur d'Alene public library. Evidence of hazardous materials along the road was not observed. The historical collection at the library was also reviewed for pertinent information regarding historical conditions along Fernan Lake Road. No pertinent information was available.

Environmental Consequences

Project Impacts. Since there is no surficial evidence or record of contamination by hazardous materials in the area that would be affected by construction, none of the Alternatives would affect or be affected by recognized environmental conditions.

Recommended Mitigation Measures

Historical data indicate the road was constructed in the 1930s. State and federal regulatory files do not show records of known adverse environmental facilities in the road corridor. Field observations did not reveal hazardous materials sites or facilities that could affect the planned improvements.

As such, mitigation measures to address known soil and groundwater contamination by hazardous materials are not warranted.

A Spill Prevention, Control, and Countermeasure Plan will be prepared by the contractor prior to construction.

Right-of-Way (ROW) and Utilities

ROW

The need for additional ROW for Alternatives E, Fm, and Preferred Alternative G was based on undated revised drawings prepared by in March and August 2003. Areas for temporary construction easements were not identified and therefore not analyzed. Further these drawings did not delineate the area needed for new ROW. This area needed was estimated based on the cut and fill lines depicted on these drawings. Acquisition costs were estimated using title information and assessed land values. Because Idaho is a non-disclosure state, sales information was not available for a comparison of market value and assessed land value. Local real estate professionals provided information on sales of comparable properties, which was used to estimate acquisition costs.

- Information from the county assessor's office includes a category called "wasteland" and applies to portions of some parcels along Fernan Lake Road. It appears that wasteland areas include those characterized by steep slopes, most of which fall within areas already encumbered by the existing road easement.

- In many cases, the cost of the area to be acquired would be minimal. However, recognizing that acquisition would involve the owner's transferring even a nominal part of his or her estate, a minimum payment to acquire the needed easement rights should be investigated.

- A minimum payment is also recommended for driveway acquisitions. There are three affected parcels. All three parcels would be affected by build alternative Fm. These impacts will be more definable at the final design stage.

- Estimated acquisition costs do not take into account any timber value that take areas may have.

- Fernan Lake Road consists of permanent easements granted to the FS rather than a dedicated road for public use for the most part. The plat maps indicate the dedication of road ROW in Fernan Village. Exact terms of the permanent easement, in regard to reversion of property rights to adjacent landowners, varies with each subdivision. Land that reverts to landowners has not been included in the calculation of the estimated cost to acquire additional easement rights. The width varies but generally measures 18 m (60 ft).

- Idaho Department of Lands (IDL) establishes the property boundary between the lake and riparian owners as the Ordinary High Water Mark at elevation 2131.37 NGVD.[3] Where the existing permanent roadway

[3] National Geodetic Vertical Datum of 1929

easement (ROW) abuts the lake, the existing (southerly) ROW was held as the lake boundary for estimating required ROW areas.

- One parcel currently has no improvements built on the property. It is believed that the property is used for camping during the summer. The proposed permanent easement for the build alternatives may cover most of the parcel and could result in a total acquisition of the property.

- A common area in the this subdivision (listed as “CAREA” in each of the build alternatives) is an area dedicated to the owners in Blocks 2, 3, 4, and 5 of the subdivision for access to the lake. Total area for the CAREA was not calculated and assessed land value was not available. Estimated cost of the acquisition was based on waterfront property value.

Environmental Consequences

Estimated acquisition areas and costs, exclusive of administrative costs, for Alternatives E, Fm, and Preferred Alternative G are as follows:

Table 3-18. Estimated Costs for Each Build Alternative

Alt	Estimated Area Metric / Standard	Estimated Cost Metric / Standard
E	106,857.97 m² / 1,150,208.48 ft²	$40,341.10 / $39,638.49
Fm	101,357.18 m²/ 1,075,717.89 ft²	$40,028.00 / $39,400.94
G*	106,857.97 m² / 1,150,208.48 ft²	$40,341.10 / $39,638.49

* Preferred Alternative

Utilities

All build alternatives would impact existing utilities. Estimated utility relocation costs are based upon data received from the affected utilities with the exception of Kootenai Electric. The same unit costs were used for all build Alternatives. Utility issues that need further analysis upon selection of an Alternative include:

- The Idaho Department of Water Resources (IDWR) provided a list of property owners with a right/license to draw water from Fernan Lake. Water system location information was not readily available for inclusion in the estimating process. Interviews with individual property owners would be needed to determine impacts to the water systems. For the purpose of the ROW acquisition cost estimates, it was assumed that water rights would not be affected and that after construction all properties would be left with water systems as good or better than before construction. It is recommended that property owners be interviewed concerning water system locations after an alternative has been selected.

- A list of parcels with septic permits was provided by the Panhandle Health District Office, but the location of septic systems was not available. Determining which septic systems, if any, which would be impacted by either build alternative will require interviewing property owners. For the purpose of the ROW acquisition cost estimates, it was assumed that septic systems would not be affected and that after construction all properties would be left with systems as good or better than before construction. It is recommended that property owners be interviewed concerning septic system locations after an alternative has been selected.

- Estimated quantities for proposed utility relocations are approximate and are subject to change based on the discretion of the utility engineer. Estimated quantities reflect the cost borne by the utility companies for relocation of their facilities within the ROW.

- Costs for salvage of the existing utilities being replaced were not addressed in this study. Costs may increase if the utility is required to remove facilities that might otherwise be abandoned or decrease if the facilities have any remaining marketable value after being salvaged. In Alternatives E, F and G utility impacts are considered.

- Major underground gas and petroleum transmission lines cross all build alternative alignments. Williams Gas Pipeline crosses perpendicular at approximately MP 3.3. Yellowstone Pipeline crosses diagonally at approximately MP 3.45. Preliminary designs for all build alternatives show fills in these areas. Communication with both utility companies is advisable prior to final design and construction.

Air Quality References

Personal Communications

Dan Redline Personal Communication. (Idaho Department of Environmental Quality). 2001.

Noise References

Documents

USDA Forest Service. 1996. *Programmatic Biological Assessment for National Forest Management and Federally Funded Watershed Restoration on Non-Federal Land.*

Hazardous Materials References – None

ROW References – None

Table 3-19 Summary of Impacts

	No Action	Alternative E	Alternative Fm	Preferred Alternative G
Length	8.05 km (5.00 miles)	7.89 km (4.91 miles)	7.99 km (4.96 miles)	8.11 km (5.04 miles)
Disturbed area	N/A	12.7 ha (31.4 acres)	15.1 ha (37.3 acres)	13.6 ha (33.6 acres)
New impervious area	N/A	1.3 ha (3.2 acres)	1.1 ha (2.7 acres)	1.5 ha (3.7 acres)
Stream impact- Length	N/A	898 m (2,946 ft.)	897 m (2,943 ft.)	901 m (2,956 ft.)
Area	N/A	6,271 m^2 (6,935 $yd.^2$)	6,340 m^2 (7,012 $yd.^2$)	6,390 m^2 (7,067 $yd.^2$)
Wetland impact- Length	N/A	4,261 m (13,980 ft.)	3,783 m (12,411 ft.)	3,761 m (12,339 ft.)
Area	N/A	19,922 m^2 (22,034 $yd.^2$)	18,049 m^2 (19,962 $yd.^2$)	19,537 m^2 (21,607 $yd.^2$)
Lake encroachment- Length	N/A	30 m (98 ft.)	60 m (197 ft.)	100 m (328 ft.)
Area	N/A	30 m^2 (33 $yd.^2$)	278 m^2 (307 $yd.^2$)	246 m^2 (272 $yd.^2$)
Bridge- Length	N/A	180 m (591 ft.)	None	118 m (387 ft)
Water Encroachment	N/A	1,800 m^2 (1,991 $yd.^2$)	None	None
Wetland Encroachment	N/A	None	None	1,180 m^2 (1,305 $yd.^2$)
Collisions per year eliminated (cumulative through 2026)	N/A	175.9 to 183.7	160.4 to 167.5	177.0 to 185.0
Water Quality	No short- term sediment loading. Continued long-term and chronic loading from existing degrading road.	Temporary increase in sediments from disturbed areas. Long-term reduction in sediment and nutrient loading. Potential for long-term increase of toxicity from increased impervious surface. Decrease in silt and dust resulting from elimination of parking along roadway. Driving piles for new bridge may	Less impact than alternatives E and G because realignment further away from the lakeshore. No short term impacts on standing water area of Lilypad Bay because of the absence of a bridge. Remaining impacts are the same as for Alternative E.	Impacts are similar to Alternative E, except: • slightly less short-term impacts because new bridge can be constructed behind existing roadway before that fill is removed; and • no risk of disturbing creosote-treated timber from the original bridge.

	No Action	Alternative E	Alternative Fm	Preferred Alternative G
		uncover old creosote-treated timber from the original bridge. Longer bridge across Lilypad Bay on lake side of existing road increases short-term disturbance and resuspension of lake sediments.		
Cultural Resources	No adverse effects on NRHP-eligible segments of Fernan Lake Road.	Impacts on cultural resources would come from the need to remove historic features such as culverts and retaining walls along Fernan Lake Road. There would not be a significant difference in the impacts on these features between the Build Alternatives.		
Fish and Wildlife		Construction will impact riparian areas and compact soil so that regeneration and recovery is slowed. Lack of riparian vegetation eliminates sources of large woody debris that forms cover, shelter and refuge that certain fish species require. Populations of some wildlife species would be reduced temporarily during construction, but normal levels would likely return after construction. An increase in construction waste and litter could also attract some wildlife species. Travel corridors for wildlife species between habitat units may be affected because of construction noise. This impact is expected to be short term. Bald Eagles are present in the project area and construction from January through August may impact the nest located one mile south of the project. No impacts are anticipated for wintering Bald Eagles. Construction would increase disturbance to pileated woodpeckers although this is expected to be short term.		
Vegetation		For all Build Alternatives impacts on vegetation are similar. During construction degradation is probable due to increased activity along the road. Potential wet habitat for plant species of concern below MP 5.0 would be affected by construction activities. Imbricate lichen would be affected by construction because habitat for this species is located in disturbed areas at the edge of the existing road. Ute ladies-tresses and water howellia are found in moist forest habitats such as along Fernan Creek and the wetland areas in Lilypad Bay. Under Alternative Fm dry forest habitat above Lilypad Bay would also be affected.		
Land Use		Property owner driveways would be affected when construction is adjacent to these areas. Property owners may be restricted as to times they can enter and exit their property. Some owners will be more affected than others as their driveways would be reconstructed to meet the new road grade or to improve safety.		
Recreation		Construction noise, odor and dust could compromise the quality of the recreation experience. Construction activities could lengthen travel times may close access temporarily. Shoreline fishing would most likely not be available at certain locations for a period of time. Planned recreation events could be disrupted.		

	No Action	Alternative E	Alternative Fm	Preferred Alternative G
Visual Resources		Activities during construction will have visual impacts. Removal of existing vegetation from road slopes would be quite apparent. Loss of screening vegetation would expose cut slopes, retaining walls and other man made elements to views from the roadway, lake and residences. Stockpiles of construction materials would impact the visual character of the are. The view from the residence above the head of Lilypad Bay would be permanently impacted under Alternative Fm.		
Socio-Economics		Construction traffic, noise and dust as well as disruption to access would impact the houses in Fernan Village and along Fernan Lake Road. Such impacts would be the same for minority and low-income individuals and as such do not disproportionately impact these populations.		
Air Quality		Air quality impacts in the vicinity of construction would be localized and temporary. Dust stirred up during construction and emissions from construction equipment and delayed vehicles could temporarily affect air quality.		
Noise		Noise impacts from blasting will vary according to factors such as placement and size of the charges. A small number of residences may require particulate care to mitigate these impacts.		
Hazardous Materials		There could be spills or leaks from construction equipment. Prior to construction a Spill Prevention, Control, and Countermeasures will be prepared.		
Section 4(f)	No impacts would occur.	All build alternatives would adversely affect historic Segments 1 and 2 of the existing road. There are no alternative routes or alignments that avoid impacts to the 4(f) property. Mitigation of impacts would include documentation of features and preparation of interpretive materials under a MOA between FHWA and Idaho SHPO.		

3.12 CONSTRUCTION IMPACTS

General Differences Between the Build Alternatives

The general methods of construction will be the same for each build alternative. The primary differences in construction of the alternatives would occur at the locations where the alignments of each alternative differ. In general, the alternative alignments differ between mileposts (MP) 1.0 and 2.2. In that stretch, the alternatives either following the existing roadway alignment (Alternative E and Preferred Alternative G) or an alignment that proceeds up and over the adjacent hillside (Alternative Fm) thereby bypassing several of the tightest horizontal curves of the along Fernan Lake. The alternatives also differ in their approach to crossing Lilypad Bay. Alignment G is in roughly the same location as the existing causeway. Alternative E is in roughly the same location as the historic bridge crossing. Alternative Fm would cross immediately north of Lilypad Bay on a fill section.

A quantitative comparison between the three build alternatives is listed in an english and metric version spreadsheet matrix attached as Table 3-20. The categories of quantity calculations for comparison of each alternative include: roadway length, typical lane width, typical pavement width, average disturbed width, disturbed area, proposed impervious area, maximum profile grades, cut and fill material, maximum cut and fill heights, length and area of lake, stream and wetland impacts, and length of bridges, retaining walls, and guardrails.

Construction Activities - General Description

The following general description of construction activities and impacts applies to all build alternatives and segments unless otherwise noted. Construction would begin with clearing of vegetation along the roadway within the roadway easements. Chainsaws would be used to fell trees while hydraulic excavators would be used for removing scrub and stumps. Debris would be rolled, dragged, or otherwise deposited on Fernan Lake Road, where it would be loaded onto dump trucks for removal to a disposal or burn site. (The location of a disposal site or sites would be determined by the contractor.) The road may be closed at the working location for no more than four-hour periods at a time.

For most of Segment 1 (MP 0.0 to MP 2.2) and part of Segment 2 (MP 2.2 to MP 5.0) there will be significant cuts into the existing steep slopes along the road corridor to allow for the wider road. Some of the cut material would be used to raise the grade of the road and to create embankments. However, more material will be removed than can be used along the road. The excess cut material would be disposed of by the contractor, most likely at a commercial landfill.

The method for excavating the slope will depend on whether the slope is made up of loose or crumbly rock or hard, solid rock. A hydraulic excavator would be used to break up and excavate top soil and crumbly rock. Excavation of solid rock would require drilling and blasting. The blasting would be done along the road in increments short enough to allow debris that is generated to be removed by trucks within four hours. This is typically 300 to 600 cubic meters (392.4 to 784.7 cubic yards).

Constructing the bridge across Lilypad Bay will create construction impacts in Alternative E and Preferred Alternative G that would not occur under Alternative Fm. The center spans of the bridge will require piling support. Piles will need to exceed 30m (100 ft) in length to reach a suitable bearing stratum below the lake. Piles will need to be driven from a barge and battened piles will be needed. End abutments will require founding on bedrock due to the presence of up to 20m (60 ft) of very soft, compressible soil that underlies the lake.

Construction of the abutment foundations and pilings to support the bridge superstructure would first require coffer dam construction to form an enclosure. Earth would be removed from the enclosure and a de-watering system would be used to remove water from the construction site. The foundation and supports would then be built of concrete. Groundwater removed by the dewatering system from the bridge construction site would be pumped to a temporary detention and treatment pond before release to the lake or infiltration to groundwater.

After the bridge (Alternative E and Preferred Alternative G) or road (Alternative Fm) is built around the bay, the fill that supports the existing Fernan Lake Road across the bay would be removed. The existing roadway fill would serve as a filter for any accidental sediment release during construction of the new road or bridge, with the exception of Alternative E because its alignment is downstream of the existing causeway.

To relocate Fernan Creek in Segment 2 as proposed in Alternatives E, Fm, and Preferred Alternative G a new stream channel would be excavated on dry land leaving a short distance of unexcavated earth at each end. Matting and other stabilization methods would be used to minimize erosion on the new channel banks. When the water is to be diverted to the new channel, the remaining earth between the new and old channel is removed. Plastic sheeting and sandbags are placed over the connection to the previous channel to complete the process of diversion and minimize erosion and turbidity. Excavated material from the road work or channel construction would be used to fill in the old channel.

In Segment 3 (MP 5.0 to MP 10.7), the project proposes to follow the existing roadway alignment and rehabilitate its pavement section. In this segment, most of the work consists of driving a specialized piece of equipment called a rotomiller reclaimer over the road surface. The reclaimer chews up the road surface to a pre-determined depth. The resulting mixture of old asphalt and rock is deposited on the road surface behind the reclaimer. This mixture is graded and compacted to create a new subsurface. Depending on the quality of the mixture, additional new asphalt or aggregate may be added to create an optimal consistency. The new subsurface is then paved over. Culverts will be replaced using a hydraulic excavator. If there is water running through the existing culvert, water would be diverted through a pipe or via a hydraulic pump to a temporary impoundment area.

In terms of construction sequencing, the preliminary plans are to begin the project with the rehabilitation of Segment 3 and move downhill towards Coeur d'Alene.

Natural Environment

Water Resources

Water Quality

Construction activities most likely to affect water quality include:

- coffer dam installation and removal during bridge construction;
- disturbance of bottom sediments during removal of the existing road crossing in Lilypad Bay;
- removal of riparian vegetation adjacent to Fernan Lake;
- grinding off of the old pavement;
- blasting during construction along the north lake shore;
- construction of retaining walls along the lake shoreline with new rock material; and
- accidental release of fill material into the lake.

Contaminated sediments could become resuspended in the lake and creek as a result of the near-shore construction. Of particular concern would be PCBs and PAHs, as well as metals and oxygen-demanding compounds.

Excavating soil during construction could result in erosion of excavated or stockpiled material as a result of high winds or rain if appropriate erosion control measures are not implemented. Culverts replaced at perennial stream crossings (Stacel Draw, MP 3.3; Dry Gulch, MP 5.4; and State Creek, MP 7.0) and new culvert placement would temporarily affect water quality through short-term increases in sedimentation and turbidity. The magnitude of effects from erosion is directly related to the amount of material exposed and the duration of construction. Consequently, a temporary increase in runoff turbidity at construction sites would be anticipated under both build alternatives unless erosion control measures are taken and revegetation is completed promptly. Temporary sediment discharge impacts include loss of clarity in the water as the lake water becomes turbid, deposition of sediment in the lake bed that may affect fish spawning areas, and an increase in soluble constituents that may be attached to the sediment. Several permits would be necessary under all action alternatives for outfall construction in water bodies.

In Segment 1, each build alternative would be susceptible to the short-term water quality impacts described above, though these impacts would be much more severe for Alternative E and Preferred Alternative G since they are sited on the lake shore for the length of Fernan Lake. Direct impacts of Alternative Fm to the lake should only occur before MP 1.0, at the crossing of the inlet stream above Lilypad Bay, and from MP 2.0 to MP 2.2.

Construction of Alternative Fm would have similar impacts to Alternative E and Preferred Alternative G except between MP 1.0 and MP 2.2. The roadway would be re-routed upslope of the existing road and away from the lake from MP 1.0 to MP 2.0. However, during removal of the existing roadway and fill, direct, short-term impacts to water quality in Segment 1 would occur from MP 1.0 to the Lilypad Bay area of Fernan Lake. Short-term impacts of Alternative Fm to Fernan Lake's algal productivity and trophic status should be negligible in terms of both sediment and nutrient delivery.

Floodplain
Construction of all build alternatives is proposed entirely above the 100-year flood plain, except in the portion of Segment 2 where the roadway needs to be raised out of the floodplain.

Hydraulics
Construction of each alternative includes the replacement of roadway culverts within Segments 1 and 2. Approximately 30 new 600-millimeter (mm) (2-ft.) diameter culverts will be required in Segments 1 and 2 for each build alternative. The culvert at Stacel Draw (MP 3.3) is recommended to be upsized to a 1800-mm (6-ft.) diameter culvert to meet hydraulic criteria.

In Segment 3, each alternative proposes to reline culverts that are corroded. The culvert at Dry Gulch (MP 5.4) is recommended to be upsized to a 1500-mm (5-ft.) diameter culvert to meet hydraulic criteria. In addition, those culverts identified by the regulatory agencies as barriers to fish passage will be replaced as required. For example, culverts at Dry Gulch (MP 5.4) and State Creek (MP 7.0) will be evaluated for upsizing to allow fish passage.

Each of the build alternatives proposes to employ roadside ditches to convey stormwater runoff. Where possible, the lower reaches of the ditches will be designed and constructed as water quality swales.

Alternative E and Preferred Alternative G each have a similarly proposed vertical alignment for Segment 1, which roughly follows the existing Fernan Lake Road profile. For these alternatives the typical grades in Segment 1 fall between 0.5 and 1.5 percent Alternative Fm roughly follows the existing Fernan Lake Road profile for only a portion of Segment 1 before taking an upland route, which bypasses many of the sharpest horizontal curves along the existing alignment. This route requires relatively steep grades to reach the plateau before descending relatively steeply prior to Lilypad Bay. The maximum grade experienced in Segment 1 for Alternative Fm is 6.0 and 7.5 percent, respectively. The steeper grades of this alternative will require consideration for erosion prevention along the ditch slopes and at their bases during final design.

Visual/Scenic
The activities or elements present during construction would have visual impacts. For instance, removal of existing vegetation from road slopes would be the largest construction impact. Loss of mature screening vegetation would expose cut slopes, retaining walls, and other man-built elements to views from the roadway, on the lake, and

for residential viewers. Immediate revegetation with shrubs, grasses, and groundcovers would "green up" construction areas in approximately five years. Re-establishment of the forested character of the slopes would take much longer (at least 20 years). Construction equipment also would be highly visible from some residences near the west end of the lake. Users on the lake would also easily notice heavy equipment working or parked near the lakeshore.

Stockpiles of materials, such as crushed rock, soil, or culverts, would impact visual character of the area if the contractor leases private land adjacent to the road for staging. Given the topography of the area, stockpiles and staging areas are unlikely in Segment 1 but could be located in Segment 2. Dust raised by equipment operation would be visible to residential viewers and recreational users if not abated by regular sprinkling.

Biological Resources

Plants and Habitats

During construction, degradation of habitat is probable due to an increase in human activity along the road. Trampling of vegetation, compaction of soils, and an increase of erosion are common forms of habitat degradation caused by human activity. Native habitat closest to roads, buildings, and recreational facilities are most susceptible to this form of degradation. Sensitive habitats such as streams and wetlands are also vulnerable.

Threatened and Species of Concern plants

Each build alternative could affect Threatened, Sensitive, and Species of Concern plants due to removal of plant species and soil as a result of construction, unless they are located, collected, and stored for replanting later. Threatened and Sensitive plants within the area of construction would likely be removed, crushed, or buried during clearing or construction.

Under Alternatives E, Fm, and Preferred Alternative G potential habitat in wetlands F, A, B, G, riparian areas of Fernan Creek, and wetland areas in Lilypad Bay would be affected by construction. Riparian and forested areas within wet and moist forest habitat guilds would be at greatest risk due to widening and realignment of Fernan Creek. Ute ladies'-tresses and water howellia are found in these habitats. Under Alternative Fm, the proposed realignment from MP 1.0 to MP 2.0 of Segment 1 would also affect plant species in dry forest habitat on the McKahan property.

FS Sensitive and FS Species of Concern Plants

Habitat in Wetlands F, A, B, G, riparian areas of Fernan Creek, and wetland areas in Lilypad Bay would be affected by construction. Potential habitat for plant species found in the moist and wet habitat below MP 5.0 would be affected by construction activities. Habitat for imbricate lichen would be affected by both action alternatives in all segments of the project because habitat for this species is located in disturbed areas at the edge of the road and in the existing road shoulder. Effects to these species would be caused by clearing and filling required to achieve an appropriate road grade and filling of Fernan Creek and associated wetlands. It is assumed that any populations present in the project construction area would likely be eradicated.

Fish and Wildlife

Road construction projects can destroy riparian areas and compact soil so that regeneration and recovery are slowed. Lack of riparian vegetation also eliminates sources of large woody debris, which typically forms most of the cover, shelter, and refuge from high flows that fish species such as trout require.

Fish

Construction activities most likely to disturb fish and fish habitat include pile driving and column construction during bridge construction, disturbance of bottom sediments during removal of the existing road crossing at Lilypad Bay, blasting during construction along the north lake shore, construction of retaining walls immediately adjacent to the lake, accidental release of fill material into the lake, and removal of riparian vegetation adjacent to Fernan Lake. Grinding and removal of old pavement in Segment 3 could also contribute to an increase in sediments in the creek that would eventually flow to the lake if precautionary measures are not taken.

Adult migration, spawning, and rearing habitat would be affected by construction activities to varying degrees depending on habitat requirements of fish species present and the extent of mitigation incorporated into the project. Contaminated sediments could become resuspended in the lake and creek as a result of the near-shore construction. Of particular concern would be PCBs and PAHs, as well as metals and oxygen-demanding compounds. Excavating soil during construction could result in erosion of excavated or stockpiled material, unless erosion control measures are implemented and revegetation occurs promptly. The magnitude of effects is directly related to the amount of material exposed and the duration of construction. A temporary increase in runoff turbidity at construction sites would be anticipated, unless treatment is provided.

Excessive sediment reduces spawning habitat by clogging interstitial spaces in gravel where trout and other fish deposit eggs. This blocks the necessary flow of water across eggs, preventing incubation. Sedimentation has also been found to reduce the abundance and diversity of aquatic insects, a critical food source for trout. Excessive sedimentation also reduces critical habitat for over-wintering trout by filling in pools.

Effects to water quality from construction in Segment 1 for each build alternative could include localized increases in turbidity, decreased oxygen levels, and increased sediment deposition in the vicinity of construction, unless appropriate erosion control measures are followed. Road removal and bridge construction at Lilypad Bay could also have adverse effects on habitat and the plants and animals that live there. Placement and removal of temporary piles necessary to support work platforms during bridge construction would result in creation of sediments and cause audible and visual disturbances, and may result in temporary avoidance of the area by fish. Substrate disturbance effects would result in a temporary reduction in prey availability at the bridge site. Periods of high water flows would eventually flush those sediments deposited during construction.

Blasting during construction in Segments 1 and 2 might affect westslope cutthroat trout and torrent sculpin should they be present during that time.

Road improvement in Segment 2 could cause direct effects to water quality in Fernan Creek during construction if appropriate erosion control measures are not implemented.

The existing road is near the creek and lake and is currently affecting water quality as discussed in the existing conditions section of Water Quality (Section IV.A.1.a).

Raising the road grade in Segment 2 of the build alternatives could cause direct effects to water quality in Fernan Creek during construction due to the following:

- relocation of the existing Fernan Creek channel from (approximately) MP 2.8 to MP 3.0 and from MP 3.5 to MP 3.9;
- increased sediment delivery to Fernan Creek during channel realignment;
- removal of riparian vegetation and resulting water temperature increases;
- increased impervious surface area, which can affect hydrological factors such as runoff rate and peak flows; and
- loss of floating-leaved wetland habitat that provides cover and food for fish.

Because Alternative Fm would widen the road entirely to the north or northwest away from the lake and creek, this alternative would have greater effect on soils and dry forest resources, but lesser effect on wetlands and aquatic resources than the other alternatives.

Other Wildlife
Effects to habitat used by other wildlife have been described above. Larger areas of relatively undisturbed habitat containing environmentally sensitive features adjacent to Fernan Creek and habitat on FS lands would remain undisturbed. The area adjacent and to the west of the existing road would be cleared for construction. Wildlife generally avoids construction areas because of the noise and human activity. Population levels of some wildlife species would be reduced temporarily during construction, but normal levels would likely return after construction. An increase in construction waste, litter, and on-site sanitary facilities could also attract some wildlife species to these disturbed areas.

FWS Threatened and Endangered Wildlife Species
Bald eagles are present in the project area, and a nest has been documented less than 2.2 km (1 mi) to the south. Bald eagle nesting activity typically occurs from January 1 to August 15, and construction during that period within 1.6 km (1 mi) of the nest would have an adverse impact on nesting eagles and chicks. Since construction would occur primarily in the summer, no impacts to wintering bald eagles would occur.

Since grizzly bear populations are thought to be extirpated from the USFS, and there have been no sightings of lynx in the watershed, no construction impacts on those species are expected. Grey wolves are known to be in the watershed for the Coeur d'Alene River, but it is unlikely that they use any part of the project area for denning or rendezvous sites. They may use lower elevations in winter for foraging. Since construction would not occur during the winter months, no construction impacts on grey wolves are expected.

FS Sensitive Wildlife Species

Seven FS Sensitive wildlife species could be in the project area and be affected by construction. Temporary noise disturbance would occur during construction in the project vicinity. If wildlife travel corridors between habitat units exist in the project vicinity they may be broken during construction. All species would most likely return to the area after the project is complete.

The most suitable habitat for black-backed woodpecker, flammulated owl, and northern goshawk is above MP 5.0 in the IPNF. The road improvements north of MP 5.0 would include areas of rehabilitation of failing road surfaces, grinding of the existing road surface, compaction and resurfacing as well as installations of guardrails, signs, and striping. These activities could cause temporary increases in noise and dust, although affected species would most likely reoccupy the area after construction.

Under the build alternatives the creek realignment in Segment 2 would have a direct impact during construction on wetland and riparian areas thereby impacting individuals or habitat for Coeur d'Alene salamander, northern leopard frog, and western boreal toad. Construction of a new bridge over Lilypad Bay and removal of the existing roadway fill would disturb the shallow water habitat in Lilypad Bay.

Management Indicator Species (MIS)

If big game, mature forest MIS, or migratory bird travel corridors between habitat units exist in the project vicinity they may be indirectly affected because of construction noise. The disturbance would be temporary and species would likely return to use the area after construction.

Construction effects would include increased disturbance to pileated woodpeckers in the project vicinity. Construction would most likely occur from April to October, so there would be no direct conflict during critical wintering months for elk, the only big game MIS in the area.

Effects to migratory bird habitat would occur as a result of road realignment and construction in the Lily Pad Bay area in both action alternatives.

Wetlands

All build alternatives would result in impacts to wetlands. For comparison, see Table 3 19. Alternatives E, Fm, and Preferred Alternative G would impact 2.0 ha (4.9 ac), 1.8 ha (4.5 ac), and 2.0 ha (4.8 ac), of existing wetlands, respectively.

Geological Resources

The environmental site assessment (Phase 1, initial) did not reveal any potentially adverse environmental sites or facilities that could affect or be affected by the planned improvements. Therefore, there would not be any impacts from construction.

Air Quality

Air quality impacts in the vicinity of construction would be localized and temporary. Dust particles stirred up during construction and vehicle emissions from construction equipment and delayed vehicles could temporarily affect air quality.

Human Environment

Traffic and Circulation

Traffic flow and circulation would be affected by the road closures and by the number of truck trips generated by the excavation activities. Road closures would result in residents, logging trucks, and recreationists either having to change their schedules or take alternative routes if available. The limited times to enter and leave the area could result in heavier than normal traffic during those periods of accessibility as vehicles wait for the opportunity to proceed. Depending on where the closure is located, this could delay residents' access to their properties.

Moving the excess excavated rock would significantly increase truck traffic on Fernan Lake Road while the rock is hauled to the disposal site. A typical dump truck holds approximately 7.6 cubic meters (10 cubic yards). Based on the preliminary designs of Alternatives E, Fm, and Preferred Alternative G, and assuming that all of the waste material will need to be removed offsite, approximately 11,100, 4,900, and 7,500, dump truck loads respectively would leave the project via Fernan Lake Road. Consequently, the number of truck trips generated by construction on Fernan Lake Road would be significant. Since the location of the disposal site is unknown, the travel route of the trucks is unknown, but likely to be through Fernan Lake Village to I-90. Some of the material may be used by the FS on projects in the IPNF, so trucks to that location would head east on Fernan Lake Road from the construction site.

The main impacts will be from the number of additional trips on the road, the noise of the trucks, and damage to the road surface from the weight of the trucks. Dump trucks loaded with rocks can weigh up to 40 tons and repeated trips (more than a hundred) can cause the pavement surface to break down. Damage to Fernan Lake Road east of the construction site would not be significant because the road would be repaired during the road reconstruction. However, damage would also be expected on Fernan Lake Road west of the construction.

Noise

Noise impacts from blasting and pile driving will vary according to factors such as the placement and size of the explosive charges and the location and length of piles. Charge placement and size will, in turn, be influenced by factors such as the cross-section of material to be cleared, the proximity to structures that could be affected by high particle velocities, and the possibility of flying rock landing in the lake. A FS report from 1996 contains rural blasting noise field measurements. The measurements were used by the project's noise engineers to calculate possible ranges of noise at the nearest residences to blasting locations along the alignment. Neither the State of Idaho nor Kootenai County has noise policies governing noise from blasting. Typical noise control regulations in other states limit noise for impulse sounds (such as blasting) to between 95 and 100 dB during daytime hours. If blast noise impacts are to be kept below these reasonable levels at most of the impacted properties, mitigation will be needed. Even with mitigation, a small number of residences in close proximity to blast areas may require particular care to mitigate the noise.

Noise impacts from pile driving would be greater for Alternative E than Preferred Alternative G. The bridge for Alternative E is near the mouth of Lilypad Bay, and thus closer to the main lake. The bridge is longer and the depth to bedrock greater than for Alternative G, so noise impacts would last longer for Alternative E. Pile driving would need to be staged from barges for Alternative E, and thus the operation would be louder than the land-based pile driving for Preferred Alternative G.

Land Use

Construction would affect property owner driveways when construction is occurring adjacent to those accesses. Temporary construction easements to allow contractors access to the slopes are proposed. Property owners may be restricted as to the times they can enter and exit their properties by road closures. Some properties will be more affected than others because their driveways would be reconstructed to meet a new road grade or to improve safety at their intersections with Fernan Lake Road. The four-hour road closures would also restrict access to and from residences east of the point of construction.

The four-hour road closure periods may restrict movement of farm vehicles and animals on Fernan Lake Road in the construction areas. Farm animals may be affected by the noise and dust created by construction activities, particularly in Segment 2.

Recreation

Construction noise, odor, and dust could compromise the quality of the recreation experience. Under each build alternative, construction activities could temporarily close access or lengthen travel times to recreation opportunities. The four-hour road closures during construction may discourage recreational use of the Fernan Lake Rod and Gun Club, the IPNF, and Fernan Lake, particularly for people living west of the project area.

Shoreline access for fishing would most likely not be available during some construction periods. The significance of this effect would be reduced by keeping portions of the shoreline accessible throughout the construction period. Under Alternative Fm, if the abandoned alignment between MP 1.0 and MP 2.0 remained accessible to the public during construction, less impact to bank fishing would occur than in Alternative E and Preferred Alternative G.

Planned recreation events could be disrupted in part or entirely due to access limitations during construction. Events potentially affected would include the summer fishing derby, and running and bicycling events. The severity of the impact could be lessened by relocating events or scheduling construction to accommodate events.

Reduction of shoreline access during construction could result in a temporary reduction of undesirable activities in the area.

Historic and Archaeological Resources

Construction impacts on cultural resources would come from the need to remove historic features such as culverts and retaining walls along Fernan Lake Road. There would not be a significant difference in construction impacts on these features between the two build alternatives.

Social and Economic

Construction traffic, noise, dust, and disruption of access during construction would impact houses in Fernan Lake Village and along Fernan Lake Road in Segment 1. Such impacts would be the same for minority and low-income people as for the general population.

Construction under the build alternatives likely would require hiring 50 to 100 workers, depending on duration of construction. The principal contractors likely would hire workers from the Coeur d'Alene-Spokane region. Expenditures related to project construction (estimated to be $9 to $14 million depending on the alternative selected) may increase employment in the area in the short term. Minority and low-income populations may benefit from construction and spin-off opportunities, which are expected to include jobs in the construction, services, and trade sectors. The project would provide minority residents opportunity for short-term employment as much as the general population of the greater Coeur d'Alene-Spokane area.

Logging trucks would be required to use other roads around the point of construction to avoid being delayed, which could impact revenues.

Utilities and Public Services

The build alternatives could impact existing utilities, including aboveground electrical and telephone/telecommunication lines and underground pipelines for natural gas and petroleum. Some utility poles for the aboveground lines may need to be relocated, causing temporary disruptions in service. Coordination with the natural gas and petroleum providers prior to construction would be needed to avoid disturbing underground pipelines.

Energy

Construction will require short-term use of energy in the form of vehicle and equipment fuel. The more cut per alternative would require relatively more fuel to accomplish the excavation. This would not likely represent a significant difference between the alternatives in terms of total energy usage.

Human Health (Hazardous Materials)

There could be spills or leaks from construction equipment. Prior to construction, the contractor will be required to prepare a Spill Prevention, Control, and Counter-Measures Plan defining the actions that would be taken in case of a spill or leak. The plan will also incorporate preventative measures to be implemented, such as the placement of refueling facilities, storage and handling of hazardous materials, etc.

3.13 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The implementation of any of the build alternatives will require similar commitment of natural, physical, human, and fiscal resources.

Implementation of the proposed action involves a commitment of a range of natural, physical, human, and fiscal resources. The conversion of private land to public right-of-way or easements in the construction of the proposed facility is considered an irreversible commitment during the time period that the land is used for a transportation facility. However, if a greater need arises for use of the land or if the highway facility is no longer needed, the land can be converted to another use. At present, there is no reason to believe such a conversion will ever be necessary or desirable.

Considerable amounts of fossil fuels, labor, and highway construction materials such as cement, aggregate, and bituminous material are expended. Additionally, large amounts of labor and natural resources are used in the fabrication and preparation of construction materials. These materials are generally not retrievable. However, they are not in short supply and their use will not have an adverse effect upon continued availability of these resources. Any construction will also require a substantial one-time expenditure of both State and Federal funds that are not retrievable.

The commitment of these resources is based on the concept that residents in the immediate area, State, and region will benefit by the improved quality of the transportation system. These benefits will consist of improved safety, accessibility, savings in time, and safer access to recreational activities which are anticipated to outweigh the commitment of these resources.

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CHAPTER 4

4.0 SUMMARY OF ENVIRONMENTAL COMMITMENTS

This Chapter summarizes the environmental commitments that would be a part of each build alternative, unless otherwise indicated. These commitments would be incorporated during final design or project implementation.

4.1 TRANSPORTATION

TC-1 The contractor will be required to perform work in a manner that assures the safety and convenience of the public and protects the residents and property adjacent to the project during construction.

TC-2 The roadway will be maintained in a safe and acceptable condition, including periods when work is not in progress. The contractor will maintain intersections with roads and residences.

TC-3 All zoning and other local regulations apply to impacts from traffic and circulation changes. A traffic management plan would be developed for different stages of construction.

TC-4 Signage and other means of communicating the location and duration of road closures to local residents will be required as part of the construction contract to assist road users in scheduling travel times.

4.2 WATER QUALITY

WR-1 All monitoring data for Fernan Lake Road stormwater runoff through existing or replaced culverts and from construction sites should be made available to water quality studies of the lake, creek, or watershed by agencies or organizations. If a bathymetric map of Fernan Lake is not produced as part of the Fernan Lake Watershed Management Plan, one should be prepared for the north shore and Lilypad Bay before construction to provide a baseline for assessing project effects on lake morphology.

WR-2 An erosion control plan should include BMPs during construction, and new stormwater design would minimize short- and long-term sedimentation impacts on water quality. BMPs, as described in the Standard Specifications for the Construction of Roads and Bridges on Federal Highway Projects (FHWA, 1996), should be implemented during construction. BMPs include erosion and sedimentation control measures, pollution control measures, stormwater management measures, spill prevention control and countermeasures, and construction waste handling procedures. The BMPs described in the Federal Highway Runoff Manual that are applicable to project conditions during construction should be employed. Erosion control measures, such as the use of straw bales, silt fences, detention ponds, infiltration trenches and basins, sand filters, grassed swales, filter strips, porous pavement, and constructed wetlands should be used to prevent erosion if spoil piles are located near water features. Appropriate de-watering ponds should be provided below all spoil deposits.

WR-3 A monitoring plan for stormwater collection and control should be prepared for IDEQ, addressing contaminants including sediment, metals, Biochemical Oxygen Demand, organic nitrogen, and total phosphorus. Materials (either temporary or permanent) resulting from the excavation should be stored outside of water features and outside the 100-year floodplain.

WR-4 The Coeur d'Alene River Ranger District of IPNF, and IDFG should be notified prior to construction in sensitive areas (e.g., wetlands and creeks). Excavation and fill in water features should not occur when fish (westslope cutthroat trout) are spawning or eggs incubating in gravels (from April 1 to July 30).

WR-5 At least 15 days prior to beginning pile driving, excavation, boring, and filling or any work within the ordinary high water line or the river, the contractor should submit a Spoil and Wastewater Containment Plan for approval by the IDWR, COE, and IDFG. The plan would detail how the existing road and fill would be removed from the lake and where the material would be disposed. The plan should also detail how the proposed realigned channel would be constructed and how and where wastewater from the site would be treated.

WR-6 Work should be accomplished according to plans developed by FHWA and appropriate permits, and approved by IDFG and IDEQ. A copy of these plans should be available on-site during construction.

WR-7 Removal of existing roadway should be accomplished so that material does not enter the water. Every effort should be made to minimize the chances of increased sedimentation to Fernan Lake and Creek. Sediment fencing should be placed between near-lake construction activities and the edge of Fernan Lake. Material should be removed from the roadway fill in Lilypad Bay, for example, in a manner that minimizes sediment production and is acceptable under appropriate regulatory permits. Surface-to-bottom, in-water silt curtains should be used around all in-water activities that disturb the lake bottom and/or shore.

WR-8 If demolition of the existing road is to include blasting, a mitigation plan to significantly reduce or eliminate impacts to fish resources must be submitted during the design phase of the project to the U.S. Fish and Wildlife Service (FWS) and IDFG for approval prior to any blasting. The plan should include timing restrictions to avoid spawning season, measures to remove and/or scare fish from the site, micro-second timing delays in blasting, and damage assessment procedures to monitor impacts to fisheries.

WR-9 Necessary tree removal within the ROW and subsequent hauling should not occur during the wet season. Log landing areas should be sited away from creeks and streamside management units, and receive adequate erosion control. Sites should be approved by the IPNF.

WR-10 Improved stormwater management should be implemented under any build alternative. Stormwater drainage ditches should be located along the entire length of the north side of the road and on both sides of the road where topography permits. Dependent on getting a maintenance agreement with the appropriate party, numerous small stormwater detention-ponding basins should be located adjacent to the road (upslope side) to allow road runoff to settle before entering stream channels or the lake. Stormwater ditches should be provided on the south side of the road where possible. Where such placement was not possible, runoff from the road would sheet flow across a vegetated water quality filter shoulder to the lake or stream.

WR-11 To avert slumping possibilities, road drainage should not be concentrated in unstable areas.

WR-12 Wastewater from project activities and water removed from within the work area during construction should be routed to stormwater detention ponds to allow sufficient removal of fine sediment and other contaminants and to meet Kootenai County Stormwater Standards prior to being discharged to stream channels or the lake.

WR-13 Under Alternative G, the new bridge upstream of the existing roadway and fill should be built before the existing road is removed so that the existing road would trap most of the sediment created during construction. During removal of the section of road across Lilypad Bay and construction of new water crossings, a silt curtain should be used in the lake to trap sediment generated during demolition.

WR-14 The proposed bridge and culverts should be designed to pass the 100-year peak flow requirement and to take into account the debris likely to be encountered. Abutments, piers, pilings, sills, approach fills, etc., should not constrict flow or cause any appreciable increase (not to exceed 6 cm [0.2 ft]) in backwater elevation (calculated at the 100-year flood) or channel-wide scour, and should be aligned to cause the least effect on water features.

WR-15 Where aggregate or earth-type material is used for paving or accumulates on the bridge, curbs should be installed and maintained to prevent the loss of this material into the water features. Bridge approach material should be structurally stable and composed of material that, if carried into the water, would not be detrimental to fish. Where possible, rock and large woody debris (timber) from road widening should be used to construct in-stream improvements.

WR-16 Concrete structures should be sufficiently cured prior to contact with water to avoid leaching. Fresh concrete should not be allowed to come into contact with surface waters.

WR-17 Where culverts are to be replaced, work should be limited to the low-flow season (summer, fall, and early winter). Exact timing is determined by water flow rather than date. In-channel work should be planned to exclude times when critical flow is exceeded. In-stream work should not occur during critical fish windows (April 1 – July 31). Gabions should be used directly below culvert outlets draining into water features. Planted vegetation or jute netting should be used on the side slopes on both sides of the road adjacent to culvert outlets to control erosion. Silt fences should be placed adjacent to all water features (riparian, wetland, lake) and during culvert replacement activities to intercept sediments during construction.

WR-18 The potential for construction-related toxic pollution accidents should be controlled by requiring that all equipment be maintained and refueled on impervious surfaces where potential spills and stormwater runoff can be contained and kept out of the 100-year floodplain. A toxic spill response plan should be designed in order to contain any spills that occur.

WR-19 Equipment used for this project should be free of external petroleum-based products while working around the lake. Equipment should be checked daily for leaks and any necessary repairs completed prior to commencing work activities along or above the river. No storage of fuel, petroleum-based products, or deleterious materials should be allowed on temporary work platforms over the lake. Equipment should be stationed on the existing roadway above the ordinary high water line or on the deck of a temporary or permanent bridge structure above the water but in an area where spills could be contained.

WR-20 Water, not oil, should be used during construction to control dust. Water from the lake or municipal sources should be used to meet construction needs. Water should not be drawn from Fernan Creek.

WR-21 Stabilization of road slopes through hydro seeding should aid control of road surface drainage. Bank sloping should be accomplished in a manner that avoids release of overburden material into the water.

WR-22 Sidecast material, cleared vegetation and debris should be properly disposed of according to state and local agency requirements. Disposal of sidecast material should be avoided in wetlands, surface channels, and the lake.

WR-23 Where riprap materials are necessary for structure protection, angular rock should be installed to withstand the 100-year peak flow. Only clean, inert material should be allowed to contact the water. No earth fill cofferdams should be allowed.

WR-24 Alteration or disturbance of banks and bank vegetation should be limited to that necessary to construct the project.

WR-25 At project completion, all disturbed areas should be protected from erosion using vegetation or other means. The road banks should be revegetated with native or other approved woody and herbaceous species.

WR-26 Because of the potential for impacts during construction, mitigation should include erosion control observation. Duties of the erosion control observer should include daily physical monitoring of all sedimentation control structures and downstream conditions within the project area. The observer, to be identified during the final design and permitting process, should assist the contractor in implementing stream and wetland mitigation plan specifications. The observer should report to the construction inspector, freeing the inspector from the monitoring duties. Erosion control measures should be implemented if work is incomplete at the end of the dry season. The observer should also be the liaison regarding fisheries issues to the county IDFG, COE, FWS and others concerned with stream and wetland mitigation plan implementation and job performance.

4.3 WETLANDS

W-1 If rerouting of the construction ROW around the wetlands is not feasible, the top 15 cm (6 in) of soil would be removed and stockpiled prior to trenching and for no more than 5 days.

W-2 Under Alternatives E, Fm, and G, the construction ROW would be narrowed as much as possible to minimize disturbance to wetland areas.

W-3 Organic soils from affected wetlands would be stockpiled and used in wetland mitigation areas.

W-4 minimize impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts

W-5 rectify the impact by repairing, rehabilitating, or restoring the affected environment

W-6 reduce or eliminate the impact over time by preservation and maintenance operations during the life of the action

W-7 compensate for the impact by replacing, enhancing, or providing substitute resources or environments

W-8 monitor the impact and the compensation project and taking appropriate corrective measures

4.4 CULTURAL RESOURCES

HA-1 During construction, measures to protect remaining structures and minimize site disturbance adjacent to the historic site would be used.

HA-2 If cultural materials are discovered during excavation, construction activities will halt until qualified historians and/or archaeologists have evaluated the materials and site.

4.5 FISH, WILDLIFE, AND VEGETATION

Project Design

FWV-1 BMPs, as described in the Standard Specifications for the Construction of Roads and Bridges on Federal Highway Projects (FHWA, 1996), should be implemented during construction. BMPs include measures for erosion and sedimentation control, pollution control, stormwater management, spill prevention control and countermeasures, and construction waste handling. Each BMP applicable to project conditions should be employed.

FWV-2 Stormwater treatment and detention should capture as much road runoff as practicable, and filter it before it enters water bodies. Stormwater should be diverted away from the lake and creek and into detention/infiltration facilities before entering water bodies. Concentration of road drainage in unstable areas should be avoided. Stormwater facilities should be designed in accordance with applicable state, county, and local agency requirements.

FWV-3 Where the road parallels Fernan Creek and Fernan Lake, future snow storage should be away from the creek and lake. Snow removal should be done in a manner that avoids damage to resources. Snow should not be stored near creeks or where snowmelt would cause erosion. This is contingent upon agreement by ESHD when they accept the completed project.

FWV-4 Where aggregate or earth type material is used for paving or accumulates on the road, every effort should be made to prevent deposits of material into the water bodies.

FWV-5 Approach material should be structurally stable and composed of material that if eroded into water would not be detrimental to fish life.

FWV-6 Stabilization of road slopes through hydro seeding and control of road surface drainage should be implemented. Bank sloping should be accomplished in a manner that avoids release of overburden material into water bodies. Overburden material from the project should be deposited so that it does not re-enter the water.

FWV-7 Riprap materials used for structure protection in the Lilypad Bay area should be clean, angular rock, which should be installed to withstand 100-year peak flow. Fish passage structures should be constructed with rocks, as required by permit stipulations.

FWV-8 Within one year of project completion, road banks should be revegetated with native or other approved woody and herbaceous species. Vegetative cuttings should be planted at a maximum interval of 1 m (3 ft) (on center) and maintained as necessary for three years to ensure 80 percent survival (or as specified in the COE permit or other approvals).

FWV-9 Riparian areas should be replanted at a 1:1 ratio with in-kind plant species. A mitigation monitoring plan would be developed for COE approval. Monitoring parameters may include water quality, fish habitat, riparian vegetation, and bank stability conditions in the creek after project completion for three years or as stipulated in the COE permit.

Construction

FWV-10 Side casting of old asphalt should not be permitted. Old roadbed materials should either be recycled on site or removed to a suitable disposal area. Removal of the existing roadway should be accomplished so that structure and associated material does not re-enter water bodies.

FWV-11 Vegetation clearing (including selected tree removal within the ROW) and subsequent hauling should not occur during the wet season, if possible, and should be completed prior to May 1 (prior to bird nesting season).

FWV-12 If possible, some of the trees removed from the ROW during construction should be placed in the edge of the lake to add structure to the shallow water habitat.

FWV-13 Only clean, inert material should be allowed to contact water bodies. No earth fill cofferdams should be allowed.

FWV-14 Alteration or disturbance of banks and bank vegetation should be limited to the minimum necessary to construct the project. Within seven calendar days of project completion, all disturbed areas should be protected from erosion using vegetation or other means.

FWV-15 Spoil piles from excavation should be stored outside the 100-year floodplain, not within water features, or hauled to an approved site. Appropriate de-watering ponds should be provided below all spoil deposits.

FWV-16 Excavation and fill in the lake and creek channel should not occur when fish such as westslope cutthroat trout are spawning or when eggs are incubating in gravels (from April 1–July 30) if such activities could potentially impact spawning areas.

FWV-17 When practicable, surface-to-bottom in-water silt curtains should be used around all in-water sediment disturbance activities, as stipulated by IDL and other permits. Silt fences should be placed adjacent to all water features (riparian, wetland, and lake) during culvert replacement activities to intercept sediments during construction.

FWV-18 When practicable, gabions should be used directly below culvert outlets draining into perennial streams, creeks, and lakes.

FWV-19 When conditions allow, planted vegetation or jute netting should be used on side slopes adjacent to culvert outlets to control erosion.

FWV-20 The Coeur d'Alene River Ranger District and the IDFG should be notified prior to construction in sensitive areas such as creeks, wetlands, and lakes.

FWV-21 A blasting plan should be submitted to appropriate agencies for approval prior to any blasting activities. The plan should address any tactics needed to remove and/or scare fish from the site, micro-second timing delays in blasting, and damage assessment procedures.

FWV-22 The possibility of toxic pollution should be controlled by requiring that, when practicable, all equipment be maintained and refueled on impervious surfaces out of the 100-year floodplain, so as to contain potential spills and stormwater runoff. A Spill Prevention Control and Countermeasures Plan should be developed, approved, and implemented to contain any spills that occur.

FWV-23 The contractor should implement all stipulations and conditions contained in the permits acquired by FHWA.

FWV-24 Equipment used for this project should be free of external petroleum-based products while working around the lake or creek. Equipment should be checked daily for leaks and necessary repairs should be completed prior to commencing work activities along or above water bodies. No fuel, petroleum-based products, or deleterious materials should be stored on temporary work platforms over the lake or creek.

FWV-25 Municipal water should be used during construction to control dust. Oil should not be used. Water from Fernan Lake, but not from Fernan Creek, could be used to meet construction needs if municipal water is not available.

FWV-26 A Stormwater Pollution Prevention Plan (SWPPP) should be part of the permit applications (IDEQ, IDL, IDFG, etc.). The SWPPP should include a provision for monitoring during construction.

FWV-27 Heavy equipment should not be operated outside construction limits in areas with soil moisture limitations.

FWV-28 Erosion control observation should occur on a weekly or daily basis during construction, depending on precipitation. The observer should be responsible for monitoring all temporary and sedimentation control structures and downstream conditions in the project area. Erosion control measures should be implemented if work is incomplete at the end of the dry season. The FHWA construction engineer should also be a liaison between the project and the county, IDFG, COE, FWS, and other agencies for issues related to fisheries, stream and wetland mitigation.

FWV-29 Where the one visible existing culvert is to be removed and the proposed bridge constructed (between MP 2.0 and MP 2.1 under Alternatives E and G), work should be limited as much as possible to the low-flow season (summer, fall, and winter).

FWV-30 Wastewater from project activities and water that may be removed from the work area during construction should be detained to allow removal of fine sediment and other contaminants and to meet Kootenai County Stormwater Standards, prior to being discharged to state waters.

FWV-31 Extra precautions should be taken for equipment operation around water features to prevent contamination.

FWV-32 Structures containing concrete should be sufficiently cured prior to contact with water to avoid leaching. Measures should be used to prevent fresh concrete from coming into contact with state waters.

FWV-33 Temporary, approved toilet facilities should be provided on-site during construction. The temporary toilets should be located away from the lake and creek.

<u>Measures for Alternative G only (Preferred Alternative)</u>

<u>Bridge construction</u>

FWV-34 If possible, the new bridge should be built before the existing road is removed, allowing the existing road to trap most of the sediment created during bridge construction.

FWV-35 The proposed bridge should be constructed so as to pass the 100-year peak flow, with a consideration of debris likely to be encountered.

<u>Mitigation Measures to Protect Terrestrial Resources</u>

FWV-36 Clearing and grubbing of potential nest-bearing vegetation in the project area should not take place during the migratory bird breeding season, which occurs from approximately May 1 to July 15.

FWV-37 Because nesting activity for bald eagles usually occurs from January 1 to August 15, blasting and pile driving within 1.6 km (1 mi) of eagle nests should take place after August 15 or after chicks have fledged if the nest is determined to be active. A biological monitor to be determined by FHWA in conjunction with partner agencies should verify that chicks have fledged prior to construction in the area. Regular construction activities should be limited when within 0.8 km (.50 mile) of the nest. This mitigation measure can be modified following a more detailed noise analysis and discussions with USFWS.

FWV-38 Grass mixes specified for ditches and sideslopes should be used with browse seed mix such as elderberry, oceanspray, mountain maple, and red-stem ceanothus to enhance wildlife habitat on disturbed areas. Seed mix should be approved by the FS and ESHD.

FWV-39 Temporary, approved toilet facilities should be provided onsite during construction. The temporary toilets should be located away from the lake and creek.

FWV-40 Garbage created during construction should be collected and hauled to a proper disposal facility. Food waste should be properly disposed of.

FWV-41 If necessary as determined by the IPNF, snags should be created where snags have been removed for safety reasons.

FWV-42 Where big-game winter ranges overlap the project area, rock crushing, blasting, and other loud noise-generating activity that may disturb wintering big game should be timed to avoid the wintering period, if possible.

FWV-43 Additional surveys for Threatened, Endangered, and Sensitive plant species may be needed according to FWS protocols prior to construction to ensure that no individual species are present.

FWV-44 Meadow areas and wetlands should not be used as staging areas for tree removal or other construction-related activities.

4.6 LAND USE

LVI-1 Traffic management efforts would be coordinated with local residents and recreational organizations such as the Fernan Rod and Gun Club, the snowmobile and ATV clubs, and other fishing and hunting clubs, to ensure their notification prior to and during all construction activities.

LVI-2 Up-to-date information on construction schedules, anticipated delays, and locations would be supplied to emergency service providers. The contractor would be required to provide immediate passage through the construction area for all emergency service vehicles.

LVI-3 For road closures or delays longer than 30 minutes, public notice would be given in advance through the local news media and by information signs. Road closures of up to 4 hours might be needed during construction along the lake.

LVI-4 The contractor would use only approved portions of the ROW for storing material and placing equipment and would not use private property for storage without written permission of the property owner.

LVI-5 Construction would be phased over two or more years. At the end of the construction season, all exposed ground would be covered or planted to protect it from erosion during winter.

4.7 VISUAL/SCENIC

V/S-1 *Road cut slopes.* Adjust final alignment to minimize road cut and fill slopes and retaining walls as much as possible while maintaining safe travel design parameters. Retain existing vegetation between the road and the lake wherever possible. Revegetate with native materials and grass mix compounded specifically for this area as necessary to blend into surroundings. Treat and grade slopes to allow optimum revegetation.

V/S-2 *Rock outcrops in road cut slopes.* Stable rock outcrops would be retained where possible. Allow for a natural, broken-faced effect on new cuts, where consistent with geotechnical conditions.

V/S-3 *Existing roadbed.* Minimize compaction by ripping and scarifying. Blend the roadway into contours of surrounding terrain as far as possible consistent with safety. Using native materials, revegetate disturbed areas to blend roadway into surroundings.

V/S-4 *Guardrails.* Select guardrail materials that complement or blend into the surroundings by utilizing timber or “self-weathering steel” or similar treatment. Consider the use of wire guardrails rather than solid rails to reduce the impact to views from the road along the lake, where consistent with safety.

V/S-5 *Culverts*. Treat culvert ends so as to disguise them. Place rock and soil around culvert ends, or apply flat, black paint or other coatings to eliminate the shiny metallic appearance.

V/S-6 *Retaining walls*. Construct retaining walls of materials that do not create high color or textural contrast to surroundings. Use curvilinear walls to conform with landforms where possible. Preserve existing vegetation where possible, and enhance by new plantings if necessary, to screen walls from sensitive viewer locations. Creating planting pockets in the retaining walls would break up the massive man-made appearance of larger walls.

V/S-7 *Bridge.* Select a bridge type that is as low to the water as possible and utilize low-contrast materials and colors to construct it.

V/S-8 *East Fernan boat dock.* Install new plantings to screen parked vehicles from the view of lake users. Preserve existing vegetation where possible.

4.8 RECREATION

Mitigation measures for land use and traffic and circulation impacts will address recreation impacts as well. No additional measures are proposed.

4.9 SOCIAL AND ECONOMIC

Adverse short-term impacts on land uses are covered under the land use discussion. There are no adverse short-term economic or environmental justice impacts. There will be beneficial short-term economic impacts. No mitigation measures are proposed.

4.10 AIR QUALITY

AQ-1 The contractor would be required to coordinate with utilities to minimize service disruptions.

AQ-2 All construction equipment will be required to be in good working condition. Regular inspection will ensure this.

AQ-3 Equipment would not be idled during periods of inactivity.

AQ-4 More energy-efficient equipment should be used where there is a choice between alternative equipment.

AQ-5 Water would be used during construction to control dust.

4.11 NOISE

There are a number of mitigation measures typically employed by explosives engineers to reduce the noise impacts of blasts. Below are several options that may be available to be used alone or in combination, depending on the site-specific circumstances. The most important mitigation measure is N-1, the requirement for the explosives engineer to develop a comprehensive blast design plan. Acceptance of a blast plan encompassing detailed procedures and all required mitigation measures prior to blasting will ensure that residents and wildlife are protected from the impacts as much as is feasible.

N-1 The explosives engineer will be required to develop a comprehensive blast design plan, including blast monitoring and blast documentation, with acceptance of the plan by FHWA required before any blasting occurs.

N-2 A pre-blast survey of local residents will be performed. Both noise and vibration will be monitored during blasting.

N-3 The explosives contractor will be required to calculate the charge size to maintain the lowest possible powder factor to accomplish the blasting goals.

N-4 The detonation cord on the surface, when used should be covered with a minimum of 6 inches of fill.

N-5 All shots should be fired in pre-drilled or dug holes that are properly stemmed or back-filled.

N-6 Sandbags or other fill should be placed over loaded holes.

N-7 Blasting caps (preferably noiseless) would be used. Cap and fuse techniques are not allowed.

N-8 No two holes should be fired side-by-side simultaneously. Millisecond delays should be used between holes.

N-9 The powder factor should be limited to one-quarter pound of explosives per cubic yard when plastering or air-gapping boulders.

4.12 HUMAN HEALTH (HAZARDOUS MATERIALS)

HZ-1 Prior to construction, the contractor will be required to prepare a Spill Prevention, Control, and Counter Measures Plan stating what actions would be taken in case of a spill or leak of hazardous materials. The plan will also incorporate preventative measures to be implemented, such as the placement of refueling facilities, storage and handling of hazardous materials, etc.

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CHAPTER 5

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5.0 DRAFT SECTION 4(F) EVALUATION

FHWA prepared this Section 4(f) evaluation because the proposed project would adversely affect an historic property, Segments 1 and 2 of Fernan Lake Road, eligible for listing on the National Register of Historic Places (NRHP). The evaluation describes the proposed action and how it might affect Section 4(f) properties, discusses alternatives that would avoid the use of the Section 4(f) properties, and describes measures undertaken to minimize harm to the properties.

5.1 PURPOSE OF THE SECTION 4(F) EVALUATION

Section 4(f) of the Department of Transportation Act of 1966 (49 U.S.C. 303 Section 4(f)) declared that "it is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites." Section 4(f) properties are publicly owned parks, recreation areas, or wildlife and waterfowl refuges of national, state, or local significance, and historic resources eligible for listing on the National Register of Historic Places or are locally significant. Section 4(f) specifies that:

> "the Secretary [of Transportation] may approve a transportation program or project…requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of an historic site of national, State, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park, area, refuge, or site) only if there is no prudent and feasible alternative to using that land; and the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use."

Section 4(f) "use" generally occurs when:

- Section 4(f) land is permanently acquired for a transportation facility,
- There is a temporary occupancy of Section 4(f) land that is adverse in terms of the Section 4(f) purposes, or
- Section 4(f) land is not incorporated into the transportation project, but the project's proximity impacts are so severe that the purpose for which the Section 4(f) site exists are substantially impaired. (This use is also known as "constructive use.")

5.2 PROPOSED PROJECT

FHWA and the partner agencies (IPNF, ITD, and ESHD) propose to reconstruct or resurface 17.2 km (10.7 mi) of Idaho Forest Highway 80 (ID FHP 80), which is commonly known as Fernan Lake Road. Reconstruction of the existing road alignment is proposed for all or most of Segment 1 along Fernan Lake and all of Segment 2 along

Fernan Creek valley. Only maintenance repair and resurfacing is proposed for Segment 3 within the IPNF boundary (Figure 5-1).

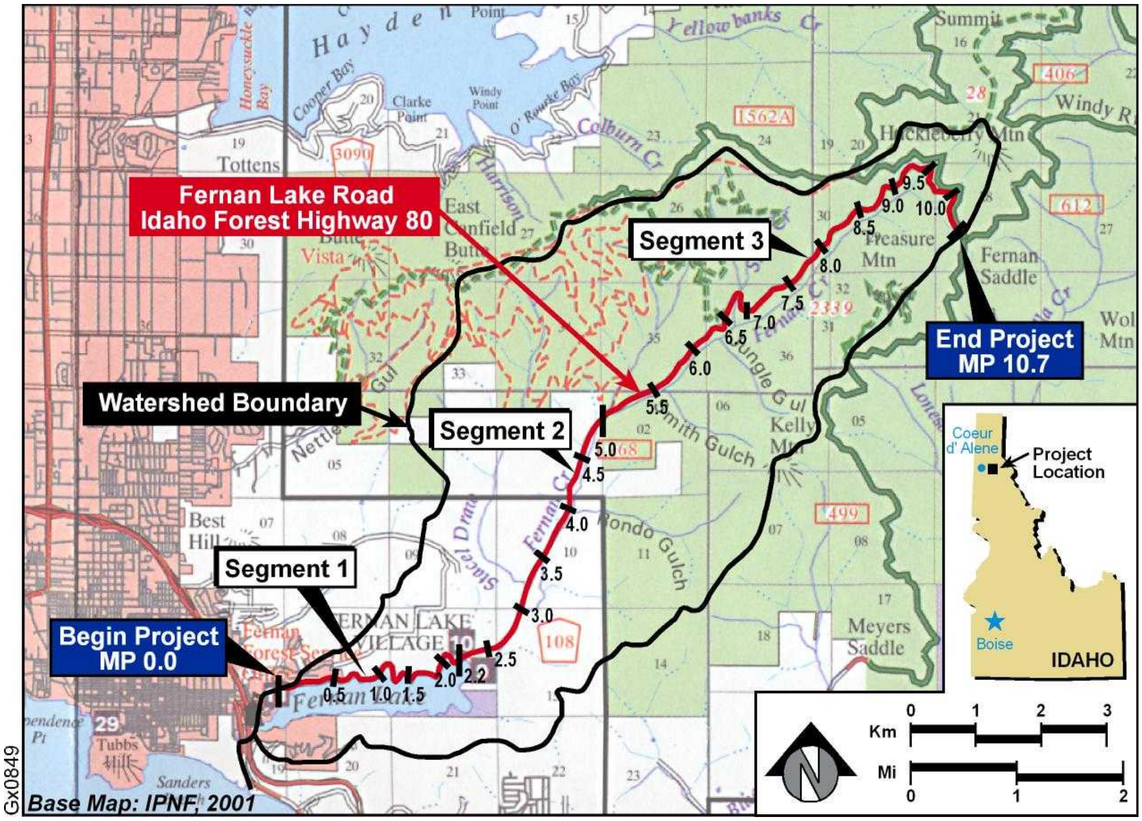

Figure 5-1. Project Location Map

Purpose and Need

The three primary reasons for the proposed road improvements are:

- To maintain an efficient transportation link between the City of Coeur d'Alene and IPNF at Fernan Saddle that safely accommodates traffic projected through 2030.
- To upgrade stormwater treatment along Fernan Lake Road to protect water quality in Fernan Creek and Fernan Lake.
- To provide a roadway that can be reasonably maintained in a sustainable manner by ESHD.

The needs and objectives for the project are described in more detail in Chapter 1 of this EIS in terms of:

- Transportation needs including safety concerns, traffic volumes, system linkages, and roadway condition,
- Maintenance needs,
- Environmental needs, and
- Needs of existing and planned land uses.

Alternatives Analyzed in Detail

Alternatives E, Fm, Preferred Alternative G, and the No Action Alternative are analyzed in this EIS. All three build alternatives would include:

- Constructing a new road surface composed of crushed aggregate base and asphalt concrete pavement.
- Installing adequate drainage structures and stormwater treatment.
- Installing sub-surface drainage features and subgrade stabilization measures.
- Widening the road to accommodate current and projected vehicular and recreational use and necessary maintenance activities.
- Removing existing fill and roadway across Lilypad Bay.
- Improving parking areas and pullouts adjacent to the road.
- Upgrading signs, striping, guardrails, and other safety-related features.
- Implementing environmental commitments to reduce or mitigate environmental impacts.

Most differences among the build alternatives occur between MP 1.0 and the end of Segment 1 at MP 2.2 (Figure 5-2). Alternatives Fm and G would also introduce a new minor curve between MP 2.2 and MP 2.3 to slow westbound traffic before the major curve north and then west around Lilypad Bay.

Alternative E in Segment 1 would follow the existing road alignment until approximately MP 1.9, where a new bridge would cross Lilypad Bay in the same place as the original bridge that was removed in the early 1960s.

Alternative Fm would leave the current road alignment between MP 1.0 and MP 1.1 and transverse the adjacent hillside (Figure 5-2). It would eventually descend the hill and cross the draw north of Lilypad Bay as curved roadway elevated up to 15.2 m (50 ft) high on fill material. The new road would continue descending south and rejoin the existing alignment near MP 2.1.

Figure 5-2. Build Alternatives between MP 1.0 and MP 2.3.

If the ROD selects Alternative Fm, FHWA anticipates modifications to the preliminary design of this alternative between the draft and Final EIS so that it would follow the terrain better and be aligned farther down the hillside, thereby reducing the height of fill needed for crossing the draw north of Lilypad Bay.

Preferred Alternative G would follow essentially the same alignment as Alternative E to approximately MP 1.9. Here Alternative G would continue north nearly on the existing road alignment and then cross Lilypad Bay on a new curved bridge just north of the existing road crossing constructed on fill. This alternative then rejoins the existing road alignment near MP 2.1.

The No Action Alternative would not reconstruct Segments 1 and 2 of Fernan Lake Road nor repair and resurface Segment 3. Routine maintenance and repairs would occur as needed. Some areas would remain below the 100-year flood elevation. Stormwater treatment of runoff from the road would not be improved.

5.3 SECTION 4(F) PROPERTIES AND ENVIRONMENTAL EFFECTS

There are no public parks, recreation areas, or wildlife refuges in the project area that require Section 4(f) evaluation. Three recreational facilities managed by Kootenai County Parks and Waterways on Fernan Lake either are not publicly owned or not affected by the project. Parking areas near MP 5.0 and the project terminus at Fernan Saddle are publicly owned, but not managed as formally designated recreation areas by IPNF, and neither would be effected by the proposed build alternatives. The shooting range operated under a special use permit from IPNF is only open to members of the Fernan Rod & Gun Club and not the general public. No wildlife or waterfowl refuges occur in the project area.

Two historic properties that were determined eligible for listing on the NRHP occur in the project area. Segments 1 and 2 of Fernan Lake Road comprises one, and would be adversely affected by all three build alternatives. The other is the Kelly homestead near MP 4.1, and none of the build alternatives would affect it. Thus the remainder of this 4(f) evaluation focuses on the road segments that are considered a historic property.

The Forest Service used two types of federal public works programs to construct Fernan Lake Road between 1934 and 1941. Enrollees in Civilian Conservation Corps (CCC) and the crews from Works Progress Administration (WPA) worked on the road. Various modifications have since been made in response to increased timber harvest and associated log hauling, and increased use by the general public. The original bridge built in 1937 across Lilypad Bay deteriorated and was replaced in the early 1960s by the current curving road constructed on fill, but the old bridge abutments remain.

Segments 1 and 2 of Fernan Lake Road are considered eligible for listing on NHRP because they are associated with events that made significant contribution to broad patterns of history. These segments retain the original narrow width and curving alignment of the road. The basic route and design of the road and its relationship to its setting along the lake and up the Fernan Creek valley remain unaltered.

Stonework constructed by CCC and blasted rock walls continue to provide strong indications of the workmanship required in the construction. A strong sense of feeling and association with the New Deal era, public works projects, and CCC remains.

5.4 AVOIDANCE ALTERNATIVES

The No Action Alternative would avoid adverse affects because Segments 1 and 2 would not be reconstructed. Maintenance and repairs would continue when necessary, as currently occurs, but underlying deficiencies and problems would not be corrected. Tight curves and restricted sight distances would continue to contribute to the high accident rate on Fernan Lake Road. The failure to improve safety for the travelling public would be contrary to a major reason for considering this an historic road, which is to allow the public to experience and appreciate the strong sense of feeling the road in its environmental setting. Thus the No Action Alternative would not fulfill the purpose and need for the project and would not be a prudent alternative.

Alternative Routes 4, 5, 6, 7, 8, 9, and 10 (Figure 5-3) would entirely avoid Fernan Lake Road and are described in more detail in Section 2.5. Alternatives 4 and 5 would require substantial new road construction on ridgelines. Alternatives 7 and 8 would route logging trucks and recreational vehicles for miles along the Lake Coeur d'Alene shoreline, increasing the probability of traffic-related water pollution to this lake. All seven of these routes have substantial portions following ridgelines at higher elevations than the current road to Fernan Saddle. Thus they would either be closed when snow-covered or require frequent plowing for long distances to remain open in winter.

None of these alternatives would meet the project purpose and need related to correcting the safety, maintenance, and stormwater treatment deficiencies of Fernan Lake Road, which would need to remain open for residences and recreational facilities along the road. None of these routes could be constructed with the available funding, either because of the length of new road construction in difficult terrain, or because of the total length of roadway to improve. Thus Alternatives Routes 4, 5, 6, 7, 8, 9, and 10 would not be prudent alternatives.

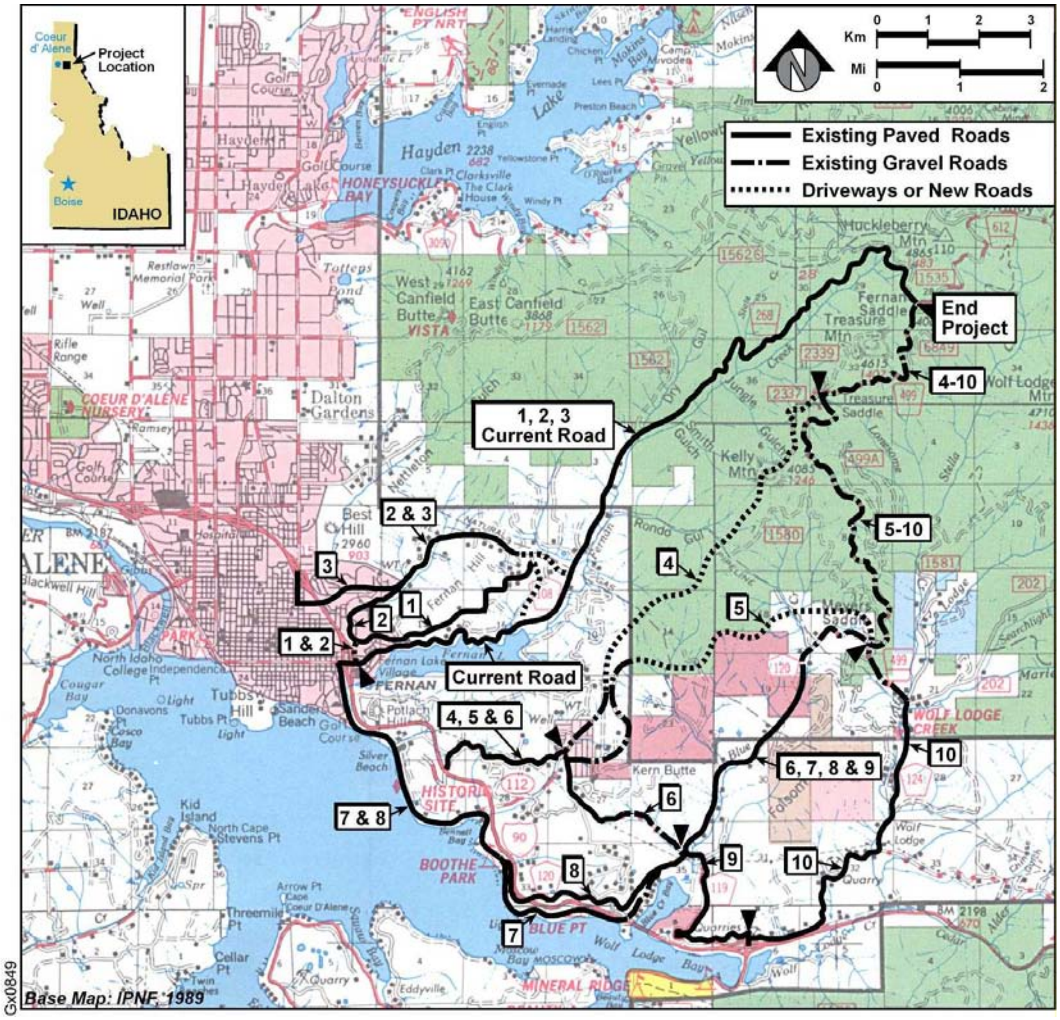

Figure 5-3. Alternative Routes

5.5 MEASURES TO MINIMIZE HARM

Alternative Routes 1, 2, and 3 (Figure 5-3) would avoid Segment 1 but would reconstruct all or part of Segment 2. Thus they reduce adverse effects to the historic road rather than avoiding them. All three would route logging trucks and recreational vehicles through residential streets and neighborhoods, creating new safety concerns. The City of Coeur d'Alene has expressed opposition to all three routes. None of these three alternatives would improve tight curves, restricted sight distances, maintenance issues, and stormwater treatment deficiencies of the existing road along the Fernan Lake, which needs to remain open for access to residences and recreational facilities. Therefore, Alternatives Routes 1, 2, and 3 would not meet the project purpose and need and would not be prudent alternatives.

Before the Record of Decision is issued that selects a build alternative for this project, FHWA and Idaho SHPO will develop and sign a Memorandum of Agreement for mitigating adverse effects of reconstructing Segments 1 and 2 of Fernan Lake Road. Mitigation of adverse effects to this historic resource would include documentation with photographs or drawings of the culverts, retaining walls, and bridge abutments that are remaining features of the original road. These features are described in Section 3.5 of this EIS.

As additional mitigation FHWA would develop an interpretive sign or display, as well as an interpretive brochure. The placement of the sign or display would be determined by IPNF, which would be responsible for its maintenance after construction. The interpretive brochure would be available to the public at the Museum of North Idaho in Coeur d'Alene and at the Fernan Ranger Station, which is conveniently located at the beginning of Fernan Lake Road.

Alternative E analyzed in this EIS would build a bridge across Lilypad Bay in the same location as the original bridge built in 1937 and removed in the early 1960s. Although this would not be minimization or mitigation per se, it would provide travelers an opportunity to experience a drive across the bay similar to that of the original road. Additional mitigation opportunities may be explored if this build alternative is selected.

5.6 COORDINATION

Table 5-1 presents the results of research on properties potentially regulated by Section 4(f), as well as Section 6(f) of the Land and Water Conservation Fund Act of 1965 (and successors of these laws). Table 5-2 presents the agency staff contacted to confirm the accuracy of the research and conclusion relative to 4(f) and 6(f) eligibility and requirements. Kootenai County Parks and Waterways concurred with the research findings for the three properties where it manages recreational facilities. Other agencies did not respond. FHWA and Idaho SHPO have continued to consult during the Section 4(f) evaluation for Fernan Lake Road.

Table 5-1. Properties Evaluated for Section 4 (f) and Section 6(f)

Property / Location / Agency	Research Results	4(f) / 6(f) Conclusion
Fernan Park Western Fernan Lake, before project starts at MP 0.0 Kootenai County Department of Parks and Waterways	1. Publicly owned and managed recreation facility/property 2. LWCFA funds used 3. Public access not affected 4. No take, use, or conversion	4(f) – Eligible but not taken or used 6(f) – Eligible but not converted
Fernan Fishing Dock Eastern Fernan Lake, project MP 1.85 Kootenai County Department of Parks and waterways	1. Publicly managed 2. No public ownership or agreement for recreational use 3. LWCFA funds not used	4(f) – Not eligible 6(f) – Not Eligible
East Fernan Boat Launch Eastern Fernan Lake, project MP 2.18 Kootenai County Department of Parks and Waterways	1. Publicly managed 2. No public ownership or agreement for recreational use 3. LWCFA funds not used	4(f) – Not Eligible 6(f) – Not Eligible
Canfield Mountain Trailhead Project MP 5.1, west side of road Idaho Panhandle National Forests	1. Publicly owned and managed 2. No take, use, or conversion planned 3. LWCFA funds not used	4(f) – Eligible but not taken or used 6(f) – Not Eligible
Forest Service Shooting Range Project MP 5.1, east side of road Idaho Panhandle National Forests	1. Publicly owned, not a managed site 2. No take, use, or conversion planned 3. LWCFA funds not used	4(f) – Not taken or used, regardless of eligibility 6(f) – Not Eligible
Fernan Rod and Gun Club Project MP 5.3 Idaho Panhandle National Forests	1. Publicly owned, operated under IPNF special use permit 2. Open to club members only 3. No take, use, or conversion planned 4. LWCFA funds not used	4(f) – Not Eligible 6(f) – Not Eligible
Fernan Saddle Trailhead After project ends at MP 10.7 Idaho Panhandle National Forests	1. Publicly owned and operated 2. No take, use, or conversion planned 3. LWCFA funds not used	4(f) – Eligible but not taken or used 6(f) – Not Eligible
Fernan Lake Road Project Segments 1 & 2, MP 0.0 to 5.0 Idaho SHPO	1. Eligible for NRHP-listing 2. Adversely affected by reconstruction 3. LWCFA funds not used	4(f) – Eligible and Taken/Used, Evaluation/Documentation Required 6(f) – Not Eligible
Kelly Homestead Project MP 4.1, east side of road Idaho SHPO	1. Possibly eligible for NRHP-listing 2. Not in Area of Potential Effect 3. LWCFA funds not used	4(f) – Possibly eligible but not taken or used 6(f) – Not Eligible

Table 5-2. Agencies Contacted / Consulted on Section 4(f) and Section 6(f)

Agency / Contact	Address	Phone / Email
Kootenai County Parks and Waterways Kurtis Robinson, Director	10905 North Ramsey Road Hayden, ID 83835	208-446-1275 krobinson@kcgov.us
Idaho Department of Fish and Game Ned Horner, Fisheries Biologist	2750 Kathleen Avenue Coeur d'Alene, ID 83814	208-769-1414 nhorner@idfg.state.id.us
Idaho Dept. of Parks and Recreation Brian Miller, North Region Grants	P.O. Box 83720 Boise, ID 83720	208-334-4180 bmiller@idpr.state.id.us
Idaho State Historic Preservation Officer Mary Anne Davis	210 Main Street Boise, ID 83702	208-334-3847 mdavis@ishs.state.id.us
Idaho Panhandle National Forests District Recreation Specialist	2502 East Sherman Avenue Coeur d'Alene, ID 83814-5899	208-769-3066 jdorrell@fs.fed.us
Idaho Panhandle National Forests Cort Sims, Forest Archaeologist	3815 Schreiber Way Coeur d'Alene, ID 83815-8363	208-765-7306 csims@fs.fed.us
National Parks Service Gloria Shinn, Outdoor Rec. Coord.	909 First Avenue Seattle, WA 98104	206-220-4126 gloria_shinn@nps.gov

6.0 LIST OF PREPARERS

WESTERN FEDERAL LANDS HIGHWAY DIVISION

Name	Responsibilities	Education	Experience
Karl Gleason, P.E.,	Overall Supervision	B.S., Civil Engineering; M.S. Forestry	25
Sajid Aftab	Project Manager	B.S., Civil Engineering; M.S., Civil Engineering	10

DAVID EVANS AND ASSOCIATES, INC.

Name	Responsibilities	Education	Experience
Victor Salemann, P.E.,	Project Manager; Traffic	B.S., Civil Engineering	21 years
Ron Bockelman	EIS Manager; Water Quality; Section 4(f)	B.S., Biology; M.S., Limnology	30 years
Dean Smith	EIS Writer/Editor	J.D. Law; B.S., Natural Resources	30 years
Cindy Callahan	Biology; Wetlands	B.S., Biology	11 years
Sue (Canniff) Platte	Biology; Wetlands	B.S., Biology	5 years
David Kennedy	Biology	B.A., Natural Resource Management	13 years
Kevin O'Hara	Biology	B.S., Environmental Horticulture; M.S., Forest Management	20 years
Mary Larkin, P.E,	Hydraulics	B.S., Civil Engineering; M.S., Environmental Engineering	7 years
Kirk Harris, P.E.,	Hydraulics; Traffic; Construction Impacts	B.S., Civil Engineering	11 years
Alex Dupey	Land Use	B.S., Planning & Public Policy; M.S. Community Planning	3 years
Kathy Schultheis	Recreation	B.S., Landscape Architecture	22 years

DAVID EVANS AND ASSOCIATES, INC. (CONTINUED)

Name	Responsibilities	Education	Experience
Dan Benson	Right-of-Way and Utilities	Certified in Relocation Assistance, Right-of-Way, Real Estate Law	26 years
Christina Weber	Right-of-Way	B.A., Video Production; IRWA Real Estate courses	11 years
Gigi Cooper	Socioeconomic	B.A., Oriental Studies; M.S., Urban & Regional Planning	7 years
Jennifer Danziger	Traffic	B.S., Civil Engineer	16 years
Terry Smith	Visual Assessment	B.S., Landscape Architecture	16 years

T.W. ENVIRONMENTAL

Name	Responsibilities	Education	Experience
Martha Moore, P.E.,	Air Quality; Noise	B.S., Environmental Resource Engineering	18 years

NORTHWEST ARCHAEOLOGICAL ASSOCIATES, INC.

Name	Responsibilities	Education	Experience
Christian J. Miss	Cultural Resources	B.A., Biology M.A., Anthropology	25 years
Nancy F. Renk	Historic Resources	M.A., History	

GRI GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS

Name	Responsibilities	Education	Experience
Dwight J. Hardin	Phase I Initial / Environmental Site Assessment	B.A., Civil Engineering M.S., Civil Engineering	31 years
George Freitag	Phase I Initial / Environmental Site Assessment	B.S. , Geology M.S., Geology	17 years

INDEPENDENT CONSULTANT

Name	Responsibilities	Education	Experience
C. Michael Falter, Ph.D.	Water Quality	B.S., Fisheries and Biology; M.S., Limnology; Ph.D., Fisheries & Aquatic Sciences	39 years

TABLE OF CONTENTS

CHAPTER 7

7.0 CONSULTATION AND COORDINATION

An issue is a particular concern regarding the environmental effects of a proposed project. The regulations governing EISs require that lead agencies determine "the significant issues to be analyzed in depth in the environmental impact statement" and to "identify and eliminate from detailed study the issues that are not significant" (40 CFR 1501.7). This process of identifying significant issues is called *scoping.* The overall purpose of scoping is to focus the environmental review on those issues that are relevant to the proposal and decision to be made.

7.1 INITIAL SCOPING

Chapter 2 discusses how issues were used to develop alternatives. FHWA convened the SEE team (FHWA, IPNF, ITD, and ESHD) during the initial project-scoping phase to identify and assess the environmental affects of the proposal and recommend alternatives for evaluation. FHWA held public meetings in May and September 2000 to learn more about issues and concerns regarding the project. More information on these events can be found in the early project newsletters (Appendix C). Public feedback was considered in FHWA's decision to prepare an EIS instead of a NEPA Environmental Assessment.

A Notice of Intent to prepare an EIS was published in the Federal Register on October 3, 2000. Letters were sent to interested agencies and individuals in May 2001. A public scoping meeting was held on June 20, 2001. The first project update distributed in September 2001 summarized the scoping process and studies being conducted.

7.2 PUBLIC INVOLVEMENT

The second project update was issued in June 2003, as technical studies were being revised to include additional alternative preliminary designs. Since then project newsletters or updates have been distributed every two or three months to keep the public informed on the project schedule, preliminary findings, and coordination with other studies. The project mailing list totals almost 500 individuals, agencies, organizations and corporations. Appendix C contains all project newsletters and updates.

Development of the Fernan Lake Watershed Management Plan in 2003 provided an opportunity to exchange information between the concurrent studies. For example, the road project provided detailed wetland results for the watershed plan. The watershed study provided results of 2003 water quality sampling to the road project. The draft watershed management plan issued in November 2003 was considered in preparing this EIS.

The March 2004 project update encouraged the public to visit FHWA's project website for Fernan Lake Road on the Internet (www.wfl.fhwa.dot.gov/projects/fernan). Project information available on the website includes purpose and need, preliminary alternatives, Project Checklist (May 2000), aerial photos, newsletters and project updates. Links are provided to related websites on boating, fishing, birding, and IPNF recreation. Some of these sites have reciprocated by providing links to FHWA's Fernan Lake Road website. FHWA's site also includes a quicknote contact form that can be used to provide comments on the project electronically. This Draft EIS can be viewed on and downloaded from the project website.

7.3 INTERAGENCY COORDINATION

In addition to periodic meetings of the SEE team agencies, the Fernan project team has coordinated with regulatory and resource agencies. Many meetings were held with individual agencies. Multi-agency project meetings were held on several occasions. Frequently contacted agencies include:

<u>Federal Agencies</u>

- Army Corps of Engineers
- Environmental Protection Agency
- Fish and Wildlife Service
- Forest Service

<u>Idaho State Agencies</u>

- Department of Environmental Quality
- Department of Fish and Game
- Department of Lands, Division of Navigable Waters
- Department Parks and Recreation
- Department of Water Resources
- State Historic Preservation Office
- Transportation Department

<u>Local Agencies</u>

- City of Coeur d'Alene
- City of Fernan Lake Village
- East Side Highway District
- Kootenai County Parks, Recreation, and Waterways Department
- Kootenai County Planning Department

Section 7 of the Endangered Species Act (ESA) requires that FHWA, as lead federal agency, consult with the U.S. Fish and Wildlife Service (FWS). As part of this consultation, FHWA is preparing a Biological Assessment (BA) that describes ESA protected species in the area, effects of the Fernan Lake Road project, and conservation and mitigation measures that will be implemented. ESA consultation must be completed before the ROD is signed. The most recent communication from FWS follows.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
UPPER COLUMBIA FISH AND WILDLIFE OFFICE
11103 EAST MONTGOMERY DRIVE
SPOKANE, WASHINGTON 99206

July 31, 2003

Cindy Callahan, Senior Biologist
David Evans and Associates, Inc.
415 - 118th Avenue Southeast
Bellevue, Washington 98005

Subject: Species List for the Proposed Fernan Lake Road Safety Improvement Project (File # 1102.0200)

Reference Number: 1-9-03-SP-0433

Dear Ms. Callahan:

This responds to your June 23, 2003, request for a list of threatened and endangered species that may occur in the vicinity of the proposed Fernan Lake Road Safety Improvement project in Kootenai County, Idaho. We understand that the project involves widening and realigning portions of Fernan Lake Road east of Coeur d'Alene, Idaho. Please use the above reference number for all future correspondence regarding this project.

We have reviewed the information you provided. Our records indicate that the following listed species may occur in the vicinity of the project and could potentially be affected by it:

Listed Species

Threatened

- Gray wolf (*Canis lupus*)
- Bald eagle (*Haliaeetus leucocephalus*)
- Ute ladies'-tresses (*Spiranthes diluvialis*)

Federal agencies must meet their responsibilities under section 7 of the Endangered Species Act of 1973, as amended (Act), as outlined in Enclosure A. Enclosure A includes a discussion of the contents of a Biological Assessment (BA), which provides an analysis of the impacts of the project on listed and proposed species, and designated and proposed critical habitat. Preparation of a BA is required for all major construction projects. Even if a BA is not prepared, potential project effects on listed and proposed species should be addressed in the environmental review for this project. Federal agencies may designate, in writing, a non-federal representative to prepare a BA. However, the involved federal agency retains responsibility for the BA, its adequacy, and ultimate compliance with section 7 of the Act.

Preparation of a BA would be prudent when listed or proposed species, or designated or proposed critical habitat, occur within the project area. Should the BA determine that a listed species is likely to be affected by the project, the involved federal agency should request section 7 consultation with the U.S. Fish and Wildlife Service (Service). If a proposed species is likely to be jeopardized or if proposed critical habitat is likely to be adversely modified by the project, regulations require conferencing between the involved federal agency and the Service. If the BA concludes that the project will have no effect on any listed or proposed species, we would appreciate receiving a copy for our information.

If you would like information concerning state listed species or species of concern, you may contact the Idaho Department of Fish and Game, at (208) 334-3402.

This letter fulfills the requirements of the Service under section 7 of the Act. Should the project plans change significantly, or if the project is delayed more than 90 days, you should request an update to this response.

Thank you for your efforts to protect our nation's species and their habitats. If you have any questions concerning the above information, please contact Carrie Cordova at (509) 893-8022.

Sincerely,

Suzanne Audet

for Supervisor

Enclosure

cc: IDFG, Coeur d'Alene

Enclosure A

Responsibility of Federal Agencies under Section 7 of the Endangered Species Act

Section 7(a) - Consultation/Conferencing

Requires: 1) Federal agencies to utilize their authorities to carry out programs to conserve endangered and threatened species;

2) Consultation with the U.S. Fish and Wildlife Service (Service) when a federal action may affect a listed species to ensure that any action authorized, funded, or carried out by a federal agency will not jeopardize the continued existence of listed species, or result in destruction or adverse modification of critical habitat. The process is initiated by the federal agency after determining that the action may affect a listed species; and

3) Conferencing with the Service when a federal action may jeopardize the continued existence of a proposed species, or result in destruction or adverse modification of proposed critical habitat.

Section 7(c) - Biological Assessment for Major Construction Activities

Requires federal agencies or their designees to prepare a Biological Assessment (BA) for major construction activities[1]. The BA analyzes the effects of the action, including indirect effects and effects of interrelated or interdependent activities, on listed and proposed species, and designated and proposed critical habitat. The process begins with a request to the Service for a species list. If the BA is not initiated within 90 days of receipt of the species list, the accuracy of the list should be verified with the Service. The BA should be completed within 180 days after its initiation (or within such a time period as is mutually agreeable between the Service and the involved federal agency). No irreversible commitment of resources is to be made during the BA process that forecloses reasonable and prudent alternatives for the project that could protect listed and proposed species. Project planning, design, and administrative actions may proceed, however, no construction may begin.

We recommend the following for inclusion in a BA: an onsite inspection of the area to be affected by the proposal, which may include a detailed survey of the area to determine if listed or proposed species are present; a review of pertinent literature and scientific data to determine the species' distribution, habitat needs, and other biological requirements; interviews with experts, including those within the Service, state conservation departments, universities, and others who may have data not yet published in scientific literature; an analysis of the effects of the proposal on the species in terms of individuals and populations, including consideration of cumulative effects of the proposal on the species and its habitat; and an analysis of alternative actions considered. The BA should document the results of the impacts analysis, including a discussion of study methods used, any problems encountered, and other relevant information. The BA should conclude whether or not any listed species may be affected, proposed species may be jeopardized, or critical habitat may be adversely modified by the project. Upon completion, the BA should be forwarded to the Service.

Major concerns that should be addressed in a BA for listed and proposed animal species include:

1. Level of use of the project area by the species, and amount or location of critical habitat;

2. Effect(s) of the project on the species' primary feeding, breeding, and sheltering areas;

3. Impacts from project construction and implementation (*e.g.*, increased noise levels, increased human activity and/or access, loss or degradation of habitat) that may result in disturbance to the species and/or their avoidance of the project area or critical habitat.

Major concerns that should be addressed in a BA for listed or proposed plant species include:

1. Distribution of the taxon in the project area;

2. Disturbance (*e.g.*, trampling, collecting) of individual plants or loss of habitat; and

3. Changes in hydrology where the taxon is found.

Section 7(d) - Irreversible or Irretrievable Commitment of Resources

Requires that, after initiation or reinitiation of consultation required under section 7(a)(2), the Federal agency and any applicant shall make no irreversible or irretrievable commitment of resources with respect to the action which has the effect of foreclosing the formulation or implementation of any reasonable and prudent alternatives which would avoid violating section 7(a)(2). This prohibition is in force during the consultation process and continues until the requirements of section 7(a)(2) are satisfied.

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[1] A major construction activity is a construction project, or other undertaking having similar physical impacts, which is a major action significantly affecting the quality of the human environment as referred to in the National Environmental Policy Act [42 U.S.C. 4332 (2)(c)].

CHAPTER 8

LIST OF TABLES

8.0 DRAFT EIS DISTRIBUTION

8.1 PUBLIC REVIEW LOCATIONS

Table 8-1 is a list of locations where this Draft EIS can be reviewed.

Table 8-1. List of Locations for EIS Distribution

Idaho Panhandle National Forests Supervisor's Office 2502 Sherman Ave. Coeur d'Alene, ID 83814	Idaho Panhandle National Forests Coeur d'Alene River Ranger District 2502 East Sherman Avenue Coeur d'Alene, ID 83814	Federal Highway Administration Western Federal Lands Highway Division 610 East Fifth Street Vancouver, WA 98661
East Side Highway District 6095 E. Mullen Trail Road Coeur d'Alene, ID 83814	Kootenai County Planning Department 451 Government Way Coeur d'Alene, ID 83814	FHWA – Idaho Division 3050 Lakeharbor Lane, Suite 126 Boise ID 83703
Idaho Transportation Department 600 W. Prairie Ave. Coeur d'Alene, ID 83815	City of Coeur d'Alene Planning Dept. 710 Mullen Ave Coeur d'Alene, ID 83814	
Coeur d'Alene Public Library 201 East Harrison Ave. Coeur d'Alene, ID 83814	Spokane Public Library 906 W. Main Spokane, WA 99201	

8.2 AGENCIES, ORGANIZATIONS, AND COMPANIES

Table 8-2 is a list of agencies, organizations, and companies to whom this Draft EIS was sent.

Table 8-2. List of Agencies, Organizations and Companies for EIS Distribution

Name	City, State
Adelphia Cable	Coeur D'Alene, ID 83815
Alliance For the Wild Rockies	Missoula, MT 59807
Audubon Society	Coeur D'Alene, ID 83814
Avista Utilities	Coeur D'Alene, ID 83814
Backcountry Horsemen	Coeur D'Alene, ID 83814
Blue Ribbon Coalition	Idaho Falls 83403-1427
CDA Musseloaders	Hayden Lake, ID 83835
CDA Snowmobile Club	Coeur D'Alene, ID 83814
Century Communications	Moscow, ID 83814
City of Coeur D'Alene	Coeur D'Alene, ID 83814
City of Coeur D'Alene Planning Department	Coeur D'Alene, ID 83814
City of Coeur D'Alene Street Division	Coeur D'Alene, ID 83814
City of Fernan Lake Village	Coeur D'Alene, ID 83814
Coeur D'Alene Press	Coeur D'Alene, ID 83814
Coeur D'Alene Tribe	Plummer, ID 83851
Coeur D'Alene School District 271	Coeur D'Alene, ID 83814
Connolly & Kroetch Inc.	Wallace, ID 83873-0469
Crown Pacific Inland Ltd Ptnshp	Portland, OR 97205-3355

Name	City, State
David Evans and Associates (Portland)	Portland, OR 97201
David Evans and Associates (Bellevue)	Bellevue, WA 98005
David Evans and Associates (Spokane)	Spokane, WA 99201
DBH Properties LP	Coeur D’Alene, ID 83814
East Side Highway District	Coeur D’Alene, ID 83814
Fernan Lake Conservation and Recreation Association	Coeur D’Alene, ID 83814
Fernan Rod & Gun Club	Post Falls, ID 83854
Idaho Conservation League	Coeur D’Alene, ID 83814
Idaho Dept of Environmental Quality	Coeur D’Alene, ID 83814
Idaho Dept of Fish and Game	Coeur D’Alene, ID 83814
Idaho Dept of Parks & Recreation	Boise, ID 83720-0065
Idaho Dept of Water Resources	Coeur D’Alene, ID 83814
Idaho Dept of Lands, Division of Navigable Waters	Coeur D’Alene, ID 83815
Idaho Forest Industries (Lafayette)	Lafayette, OR 97127-9638
Idaho Forest Industries (Chicago)	Chicago, IL 60641-1916
Idaho Forest Industries	Coeur D’Alene, ID 83816
Idaho Historic Preservation Council	Boise, ID 83701-1495
Idaho Panhandle National Forests – Coeur d’Alene River Ranger District	Coeur D’Alene, ID 83814
Idaho Panhandle National Forests – Sandpoint Ranger District	Sand Point, ID 83864-9809
Idaho Panhandle National Forests – Supervisor’s Office	Coeur D’Alene, ID 83814
Idaho Transportation Department	Boise, ID 83703-5879
Idaho Transportation Dept	Coeur D’Alene, ID 83815
Kootenai County Commissioners	Coeur D’Alene, ID 83814
Kootenai Environmental Alliance	Coeur D’Alene, ID 83816-1598
Kootenai County Building Dept	Coeur D’Alene, ID 83814
Kootenai County Parks & Waterways	Hayden, ID 83835
Kootenai County Planning Dept	Coeur D’Alene, ID 83814
Kootenai County Sheriff’s Dept	Coeur D’Alene, ID 83816
Kootenai County Water District No. 1	Coeur D’Alene, ID 83814
Kootenai Electric Cooperative	Hayden, ID 83835
Kootenai Medical Center	Coeur D’Alene, ID 83814
Lang Lang & Company	Santa Ana, CA 92705-8509
McKahan & Sons LT Ptnshp	Coeur D’Alene, ID 83814-6833
National Wildlife Federation	Missoula, MT 59802
Nordic Ski Club	Coeur D’Alene, ID 83814
Norga Inc	Los Angeles, CA 90024-3217
North Idaho College	Coeur D’Alene, ID 83814
North Idaho Flycasters	Coeur D’Alene, ID 83814
Northwest Lands Unlimited LLC	Liberty Lake, WA 99019
NTL Engineering & Geoscience, Inc.	Great Falls, MT 59403-3269
Panhandle Health District	Coeur D’Alene, ID 83814
People for the West	Coeur D’Alene, ID 83814
Ponderosa Springs Golf Course	Coeur D’Alene, ID 83814
Rider Family LLC	Coeur D’Alene, ID 83814
Rural Sanitation Co, Inc.	Coeur D’Alene, ID 83814
Seco Financial Group, Inc.	Yakima, WA 98909-1588
Shoshone County Commissioners	Wallace, ID 83873
State of Idaho	Boise, ID 83720-3720

Name	City, State
The Ecology Center	Missoula, MT 59802
US Geological Society	Spokane, WA 99201
US Army Corps of Engineers	Boise, ID 83702
US Army Corps of Engineers	Coeur D'Alene, ID 83815
US Bureau of Land Management	Coeur D'Alene, ID 83814-3407
US EPA Region 10	Seattle, WA 98101
US EPA Region 10	Boise, ID 83705
US EPA Region 10 CDA Field Office	Coeur D'Alene, ID 83864
US Fish & Wildlife Service	Spokane, WA 99206
US Fish & Wildlife Service	Boise, ID 83709
US Senator Larry Craig	Coeur D'Alene, ID 83814
US Senator Mike Crapo	Coeur D'Alene, ID 83814
US Forest Service – Northern Region	Missoula, MT 59807
Verizon Engineering Dept	Coeur D'Alene, ID 83816-1924
Wolf Lodge Inn, LLC	Coeur D'Alene, ID 83814
Yellowstone Pipeline	Spokane, WA 99212

8.3 INDIVIDUALS

FHWA did not receive any requests from individuals for the complete Draft EIS.

The March 2004 project update notified everyone on the project mailing list (approximately 500 addresses) that the complete Draft EIS would be sent to agencies, organizations, and companies. All individuals would be sent the Summary from the Draft EIS, but only those requesting it would be sent the entire document. No requests were received by FHWA.

Another project update was sent with the Summary from the Draft EIS to the entire mailing list. That update also indicated that individuals could request the complete Draft EIS from FHWA. The Notice of Availability for the EIS, published by the Federal Register, Coeur d'Alene Press, and Spokane Spokesman – Review also advised individuals that they could obtain copies of the complete Draft EIS from FHWA.

9.0 REFERENCES

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Agency Contacts and Personal Communications

Akuff, Pat. Mayor, Fernan Lake Village, Idaho. Telephone conversation, March 20, 2002.

Anthony, Steve. Recreation Director, Recreation, City of Coeur d'Alene. Telephone communication with K. Schultheis, October 11, 2001.

Deeds, S. 2003. Bull Trout Biologist. FWS. Personal communication. Spokane. 2003.

FEMA (Federal Emergency Management Agency). 1984b. Flood Insurance Study: Cities of Spirit Lake, Post Falls, Fernan Lake, Coeur d'Alene, and unincorporated areas of Kootenai County.

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FLWTAC (Fernan Lake Watershed Technical Advisory Committee). 2003. *Fernan Lake Watershed Management Plan (November 2003 Draft).*

FS (US Forest Service, Idaho Panhandle National Forests). V. Goodnow, Botanist; Wade Jerome, Biologist; Ed Lider, Fisheries Biologist; C. Philbrook, Wildlife Biologist; and G.

Warden, Wildlife Biologist (Coeur d'Alene River Ranger District); and Betsy Hamet, Botanist (Sandpoint District).

FWS (US Fish & Wildlife Service). Janice Engle, Fish and Wildlife Biologist. Scott Deeds, Bull Trout Biologist.

Goodnow, V. Botanist, IPNF, Coeur d'Alene River Ranger District. Personal communication. September 2000.

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APPENDIX A:

PRELIMINARY DESIGNS OF BUILD ALTERNATIVES

Note: Location phase drawings are provided for Preferred Alternative G. For Alternatives E and Fm, drawings are provided only for those portions of the preliminary design that differ from Alternative G.

APPENDIX B:

SCREENING RESULTS FOR ALTERNATIVE ROUTES ELIMINATED FROM CONSIDERATION

APPENDIX C:

PROJECT NEWSLETTERS AND UPDATES

Note: Newsletters and project updates are in reverse chronological order (most recent first).